Prospectus Supplement
(to Prospectus dated September 20, 2017)

Filed pursuant to Rule 424(b)(5)
Registration No. 333-218514

1,982,000 Shares of Common Stock

We are offering 1,982,000 shares of common stock. In a concurrent private placement, we are selling to the purchasers of shares of our common stock in this offering, Series F warrants to purchase an aggregate of 1,982,000 shares of our common stock ("Warrant Shares") at an exercise price of $2.40 per share. The offering and sale of Series F warrants and the shares of our common stock issuable upon the exercise of the Series F warrants are not being registered under the Securities Act of 1933, as amended (the "Securities Act") are not being offered pursuant to this prospectus supplement and the accompanying prospectus, and are being offered pursuant to the exemption provided in Section 4(a)(2) under the Securities Act and Rule 506(b) promulgated thereunder.

In a separate concurrent private placement transaction, we are selling 2,018,000 shares of common stock together with Series G warrants to purchase an aggregate of up to 2,018,000 shares of common stock. The Series G warrants are immediately exercisable on the closing date of the offering at an exercise price of $2.40 per share and will expire on the fifth anniversary of the closing date. The shares of common stock, the Series G warrants and the shares of our common stock issuable upon the exercise of the Series G warrants, are not being offered pursuant to this prospectus supplement and the accompanying prospectus and are being offered pursuant to the exemption provided in Section 4(a)(2) under the Securities Act and Rule 506(b) promulgated thereunder.

Our common stock is listed on the Nasdaq Capital Market under the symbol "CLRB." On May 16, 2019, the last reported sale price of our common stock on the Nasdaq Capital Market was $2.18 per share.

As of May 16, 2019, the aggregate market value of our outstanding common stock held by non-affiliates was approximately $15.1 million, which was calculated based on 5,303,772 shares of outstanding common stock held by non-affiliates and on a price per share of $2.85, which was the closing price of our common stock on the Nasdaq Capital Market on March 19, 2019. As of the date hereof, we have not offered any securities pursuant to General Instruction I.B.6 of Form S-3 during the 12 calendar months prior to and including the date of this prospectus supplement.

You should read this prospectus supplement and the accompanying prospectus and the documents incorporated by reference in this prospectus supplement carefully before you invest.

Investing in our securities involves a high degree of risk. See "Risk Factors" beginning on page S-8 of this prospectus supplement for more information.

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

	Per Share of Common Stock	Total
Public offering price	$ 2.50	$ 4,955,000
Placement agent fees[(1)]	$ 0.1875	$ 371,625
Proceeds to us (before expenses)	$ 2.3125	$ 4,583,375

(1) We have also agreed to reimburse the placement agent for certain expenses. See "Plan of Distribution."

We expect that delivery of the shares of our common stock being offered pursuant to this prospectus supplement and the accompanying prospectus will be made to purchasers on or about May 20, 2019.

Roth Capital Partners

The date of this prospectus supplement is May 17, 2019.

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Prospectus Supplement

Prospectus

ABOUT THIS PROSPECTUS SUPPLEMENT

This document consists of two parts. The first part is this prospectus supplement, which describes the specific terms of the offering and other matters relating to us. The second part is the accompanying prospectus, which provides more general information about the securities we may offer from time to time, some of which may not apply to this offering. This prospectus supplement and the accompanying prospectus are part of a registration statement that we filed with the Securities and Exchange Commission, or the SEC, using the SEC's shelf registration rules. You should read this prospectus supplement, the registration statement of which this prospectus supplement forms a part, and the accompanying prospectus, together with the documents incorporated by reference and the additional information described under the heading "Where You Can Find More Information" in the accompanying prospectus before making an investment decision.

To the extent there is a conflict between the information contained in this prospectus supplement, on the one hand, and the information contained in the accompanying prospectus, on the other hand, the information contained in this prospectus supplement shall control. If any statement in this prospectus supplement conflicts with any statement in a document that has been incorporated herein by reference, then you should consider only the statement in the more recent document. You should assume that the information contained in this prospectus supplement, the accompanying prospectus and the documents incorporated by reference is accurate only as of their respective dates.

We have not, and the placement agent has not, authorized any person to provide you with any information or to make any representation other than as contained in this prospectus supplement or in the accompanying prospectus and the information incorporated by reference herein and therein. We and the placement agent do not take any responsibility for, and can provide no assurance as to the reliability of, any information that others may provide you. The information appearing or incorporated by reference in this prospectus supplement and the accompanying prospectus is accurate only as of the date of this prospectus supplement or the date of the document in which incorporated information appears unless otherwise noted in such documents. Our business, financial condition, results of operations and prospects may have changed since those dates.

The distribution of this prospectus supplement and the accompanying prospectus and the offering of the common stock in certain jurisdictions may be restricted by law. We are not, and the placement agent is not, making an offer of the common stock or Series B Preferred Stock in any jurisdiction where the offer is not permitted. Persons who come into possession of this prospectus supplement and the accompanying prospectus should inform themselves about and observe any such restrictions. This prospectus supplement and the accompanying prospectus do not constitute, and may not be used in connection with, an offer or solicitation by anyone in any jurisdiction in which such offer or solicitation is not authorized or in which the person making such offer or solicitation is not qualified to do so or to any person to whom it is unlawful to make such offer or solicitation.

Unless otherwise stated or unless the context otherwise requires, all references to "we," "us," "our," "our company" or "the Company" in this prospectus refer collectively to Cellectar Biosciences, Inc., a Delaware corporation.

Our Internet address is *www.cellectar.com*. There we make available free of charge, on or through the investor relations section of our website, annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K and amendments to those reports filed pursuant to Section 13(a) or 15(d) of the Exchange Act as soon as reasonably practicable after we electronically file such material with the SEC. The information found on our website is not part of this prospectus supplement or the accompanying prospectus.

FORWARD-LOOKING STATEMENTS

This prospectus supplement, including the documents that we incorporate by reference, contains 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"). Examples of our forward-looking statements include:

- our current views with respect to our business strategy, business plan and research and development activities;
- the progress of our product development programs, including clinical testing and the timing of commencement and results thereof;
- our projected operating results, including research and development expenses;
- our ability to continue development plans for CLR 131, CLR 1800 series, CLR 1900 series, CLR 2000 series, CLR 2100 series, CLR 2200 series and CLR 12120 series;
- our ability to maintain orphan drug designation and in the U.S. for CLR 131 as a therapeutic for the treatment of multiple myeloma, neuroblastoma, osteosarcoma, rhabdomyosarcoma and Ewing's sarcoma, and the expected benefits of orphan drug status;
- the volatile market for priority review vouchers;
- our ability to pursue strategic alternatives;
- our anticipated use of proceeds from this offering;
- our ability to advance our technologies into product candidates;
- our consumption of current resources and ability to obtain additional funding;
- our current view regarding general economic and market conditions, including our competitive strengths;
- assumptions underlying any of the foregoing; and
- any other statements that address events or developments that we intend or believe will or may occur in the future.

In some cases, you can identify forward-looking statements by terminology such as "expects," "anticipates," "intends," "estimates," "plans," "believes," "seeks," "may," "should," "could" or the negative of such terms or other similar expressions. Accordingly, these statements involve estimates, assumptions and uncertainties that could cause actual results to differ materially from those expressed in them. Forward-looking statements also involve risks and uncertainties, many of which are beyond our control. Any forward-looking statements are qualified in their entirety by reference to the factors discussed throughout this prospectus.

You should read this prospectus and the documents that we reference herein and therein and have filed as exhibits to the registration statement, of which this prospectus is part, completely and with the understanding that our actual future results may be materially different from what we expect. You should assume that the information appearing in this prospectus is accurate only as of the date on the front cover of this prospectus or such prospectus supplement. Because the risk factors referred to above could cause actual results or outcomes to differ materially from those expressed in any forward-looking statements made by us or on our behalf, you should not place undue reliance on any forward-looking statements. Further, any forward-looking statement speaks only as of the date on which it is made, and we undertake no obligation to update any forward-looking statement to reflect events or circumstances after the date on which the statement is made or to reflect the occurrence of unanticipated events. New factors emerge from time to time, and it is not possible for us to predict which factors will arise. In addition, we cannot assess the impact of each factor on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements. We qualify all of the information presented in this prospectus and any accompanying prospectus supplement, and particularly our forward-looking statements, by these cautionary statements.

SUMMARY

Overview

We are a clinical stage biopharmaceutical company focused on the discovery, development and commercialization of drugs for the treatment of cancer. Our core objective is to leverage our proprietary phospholipid drug conjugate™ (PDCs™) delivery platform to develop PDCs that specifically target cancer cells to deliver improved efficacy and better safety as a result of fewer off-target effects. Our PDC platform possesses the potential for the discovery and development of the next generation of cancer-targeting treatments and we plan to develop PDCs independently and through research and development collaborations.

CLR 131 and PDC Platform

Our lead PDC candidate, CLR 131, provides targeted delivery of the cytotoxic (cell-killing) radioisotope iodine 131. CLR 131 is in a Phase 2 clinical study in relapsed or refractory ("R/R") multiple myeloma ("MM"), diffuse large B-cell lymphoma ("DLBCL"), Waldenstrom's macroglobulinemia ("LPL"), mantle-cell lymphoma ("MCL"), marginal zone lymphoma ("MZL") and chronic lymphoblastic lymphoma ("CLL"), and Phase 1 clinical study for R/R MM. Additionally, we have initiated a Phase 1 clinical study evaluating the following relapsed or refractory pediatric indications; brain tumors, neuroblastoma, osteosarcoma, rhabdomyosarcoma, Ewing's sarcoma, and several lymphomas.

In order to preserve financial resources, we have focused our proprietary early stage research efforts on projects that we believe can provide the greatest near-term value. Our pipeline includes a PDC chemotherapeutic program in drug discovery, CLR 1900. CLR 1900 is being targeted for solid tumors with a payload that inhibits mitosis (cell division) which is a validated pathway for treating cancers.

We have leveraged our PDC platform to establish four collaborations featuring five unique payloads and mechanisms of action. Through research and development collaborations, our strategy is to generate near-term capital, supplement internal resources, gain access to novel molecules or payloads, accelerate product candidate development and broaden our proprietary and partnered product pipelines.

Our PDC platform provides selective delivery of a diverse range of oncologic payloads to cancerous cells, whether a hematologic cancer or solid tumor, the primary tumor, or a metastatic tumor and cancer stem cells. The PDC platform's mechanism of entry does not rely upon specific cell surface epitopes or antigens as are required by other targeted delivery platforms. Our PDC platform takes advantage of a metabolic pathway utilized by all tumor cell types in all stages of the tumor "cycle." Tumor cells modify regions on the cell surface as a result of the utilization of this metabolic pathway, our PDCs bind to these regions and directly enter the intracellular compartment. This allows the PDC molecules to accumulate over time, which enhances drug efficacy, and to avoid the specialized highly acidic cellular compartment known as lysosomes, which allows the PDC to deliver molecules that previously could not be delivered. Additionally, molecules targeting specific cell surface epitopes face challenges in completely eliminating a tumor because the targeted antigens are expressed in limited in the total numbers on the cell surface, have longer cycling time from internalization to being present on the cell surface again upon binding and are not present on all tumor cells of a particular cancer type. This means a subpopulation of tumor cells will always exist that be non-targetable by therapies targeting specific surface epitopes. In addition to the benefits provided by the mechanism of entry, PDCs offer the potential advantage of having the ability to be conjugated to molecules in numerous ways, thereby increasing the types of molecules selectively delivered via the PDC.

The PDC platform features include the capacity to link with almost any molecule, provide a significant increase in targeted oncologic payload delivery and the ability to target all tumor cells. As a result, we believe that we can generate PDCs to treat a broad range of cancers with the potential to improve the therapeutic index of oncologic drug payloads, enhance or maintain efficacy while reducing adverse events by minimizing drug delivery to healthy cells, and increasing delivery to cancerous cells and cancer stem cells.

We employ a drug discovery and development approach that allows us to efficiently design, research and advance drug candidates. Our iterative process allows us to rapidly and systematically produce multiple generations of incrementally improved targeted drug candidates.

Supply of CLR 131

Centre for Probe Development and Commercialization ("CPDC") is our exclusive source to supply drug product for our ongoing research and clinical studies, including our Phase 1 and Phase 2 studies of CLR 131. On August 7, 2018, we were notified by CPDC that it was subject to an Import Alert 66-40, the ("Import Alert"), by the U. S. Food and Drug Administration ("FDA"). While the basis for the Import Alert was not related to CLR 131 or CPDC's production facility associated with CLR 131, CPDC informed us on August 8, 2018 that CPDC would not be able to supply CLR 131 to us until the Import Alert was lifted or alternative agreements were reached with the FDA. On March 19, 2019, we announced that the FDA had granted an exemption to the Import Alert in connection with our pediatric Investigational New Drug Application ("IND"). As previously announced on November 12, 2018, the FDA had granted an exemption to the CPDC Import Alert for our hematology IND. These exemptions allows us to enroll patients in all of our ongoing and planned clinical trials and CLR 131 is no longer subject to the CPDC's Import Alert for any of the our existing INDs.

Clinical Pipeline

CLR 131 is a small-molecule, cancer-targeting radiotherapeutic PDC designed to deliver cytotoxic radiation directly and selectively to cancer cells and cancer stem cells. CLR 131 is our lead therapeutic PDC product candidate and is currently being evaluated in both Phase 2 and Phase 1 clinical studies. The initial IND application was accepted by the FDA in March 2014 with multiple INDs submitted since that time. Initiated in March 2017, the primary goal of the Phase 2 study is to assess the compound's efficacy in a broad range of hematologic cancers. The Phase 1 study is designed to assess the compound's safety and tolerability in patients with R/R MM (to determine maximum tolerated dose) and was initiated in April 2015. The FDA previously accepted our IND application for a Phase 1 open-label, dose-escalating study to evaluate the safety and tolerability of a single intravenous administration of CLR 131 in up to 30 children and adolescents with cancers including neuroblastoma, sarcomas, lymphomas (including Hodgkin's lymphoma) and malignant brain tumors. This study was initiated during the first quarter of 2019. These cancer types were selected for clinical, regulatory and commercial rationales, including the radiosensitive nature and continued unmet medical need in the relapse/refractory setting, and have been determined to be rare diseases by the FDA based upon the current definition within the Orphan Drug Act.

In December 2014, the FDA granted orphan drug designation for CLR 131 for the treatment of multiple myeloma. In 2018, the FDA granted orphan drug and rare pediatric disease designations for CLR 131 for the treatment of neuroblastoma, rhabdomyosarcoma, Ewing's sarcoma and osteosarcoma. The FDA will award priority review vouchers to sponsors of rare pediatric disease products that meet the specified criteria. The key criteria to receiving a priority review voucher is that the disease being treated is life-threatening and that it primarily effects individuals under the age of 18. Under this program, a sponsor who receives an approval for a drug or biologic for a "rare pediatric disease" can receive a priority review voucher that can be redeemed to receive a priority review of a subsequent marketing application for a different product. Additionally, these priority review vouchers can be exchanged or sold to other companies for them to use the voucher.

Phase 2 Study in Patients with R/R select B-Cell Malignancies

On May 13, 2019, we announced that the FDA has granted Fast Track designation for CLR 131 in fourth line or later relapse/refractory multiple myeloma in connection with our ongoing Phase 2 clinical study in patients with relapsed or refractory multiple myeloma and other select B-Cell lymphomas. On February 25, 2019 we announced positive top-line results from our ongoing Phase 2 clinical study of CLR 131. CLR 131 has demonstrated activity in at least three different hematologic malignancies. In the relapse refractory multiple myeloma cohort of this Phase 2 study, patients were administered one 30-minute infusion of 25mCi/m^2 and low dose dexamethasone (40mg weekly for up to 12 weeks). CLR 131 achieved a 30% overall response rate in the first 10 evaluable patients. Overall response rate means patients achieved a partial response or better. One patient had a very good partial response (a 90% or greater decrease in a surrogate marker) and two had partial responses (a 50% to 89% decrease in a surrogate marker) as defined by the International Myeloma Working Group. The patients in this cohort average six prior lines of systemic therapy. All patients in the multiple myeloma cohort achieved a minimum of stable disease. As a result of these outcomes, we have expanded this cohort to include up to 30 additional patients. Historically, patients receiving 4th line chemotherapy treatment have shown a 15% response rate, and patients receiving 5th line chemotherapy have shown an 8% response rate, whether dosed as mono-therapy or in combination. The multiple myeloma average treatment response rates ("RR") provided by line of therapy were obtained through Decision Resource Group, a global information and technology vendor specializing in healthcare data analysis utilizing over 12.5 billion U.S. insurance claims and 90 million electronic medical records. Based upon Phase 1 data, the dosing of CLR 131 in this Phase 2 study was recently modified for all indications to a 37.5mCi/m^2 fractionated dose of 18.75mCi/m^2 administered on days 1 and 8 which is approximately one and a half times more drug than the 25mCi/m^2 single infusion.

In July 2018, we announced that after a single 25mCi/m^2 IV administration of CLR 131, patients with relapsed/refractory aggressive DLBCL were assessed for response. These interim data showed a 33% ORR and a 50% CBR. In addition, the observed responses to date show overall tumor reduction ranged from 60% to greater than 90%. As a result of these favorable outcomes, we have expanded this cohort to include up to 30 additional patients. We also announced that a patient in the lymphoplasmacytic lymphoma (LPL) or Waldenstrom's macroglobulinemia arm showed a greater than 90% reduction in tumor burden and complete resolution in four of five masses with the fifth tumor being reduced by over 90% of its initial tumor volume after two doses of CLR 131 separated by 123 days. Efficacy for all lymphoma patients will be determined according to Lugano criteria. The Company intends to announce further data from additional cohorts later this year.

In July 2016, we were awarded a $2,000,000 National Cancer Institute (NCI) Fast-Track Small Business Innovation Research grant to further advance the clinical development of CLR 131. The funds are supporting the Phase 2 study initiated in March 2017 to define the clinical benefits of CLR 131 in R/R MM and other hematologic malignancies with unmet clinical need. These hematologic malignancies include Chronic Lymphocytic Leukemia, Small Lymphocytic Lymphoma, Marginal Zone Lymphoma, Lymphoplasmacytic Lymphoma and Diffuse Large B-Cell Lymphoma ("DLBCL"). The study is being conducted in approximately 10 U.S. cancer centers in patients with orphan-designated relapse or refractory hematologic cancers. The study's primary endpoint is clinical benefit response (CBR), with additional endpoints of Overall Response Rate (ORR), PFS, median OS and other markers of efficacy following a single 25.0 mCi/m^2 dose of CLR 131, with the option for a second 25.0 mCi/m^2 dose approximately 75-180 days later. Based on the performance results from cohort 6 of our Phase 1 study in patients with R/R MM, reviewed below, we have modified the dosing regimen of this study to a 37.5mCi/m^2 fractionated dose of 18.75mCi/m^2 administered on days 1 and 8.

Phase 1 Study in Patients with R/R Multiple Myeloma

CLR 131 in combination with dexamethasone is currently under investigation in a Phase 1 study in adult patients with R/R MM following treatment with at least one proteasome inhibitor and at least one immunomodulatory agent. This clinical study is a standard three-by-three dose escalation safety study. Multiple myeloma is an incurable cancer of the plasma cells and is the second most common form of hematologic cancers. Secondary objectives include the evaluation of therapeutic activity by assessing surrogate efficacy markers, which include M protein, free light chain ("FLC"), progression free survival ("PFS") and overall survival ("OS"). All patients have been heavily pretreated with an average of 6 prior lines of therapy. CLR 131 was deemed by an independent data monitoring committee to be safe and tolerable up to its planned maximum single dose of 31.25 mCi/m^2. The four single dose cohorts examined were: 12.5 mCi/m^2, 18.75 mCi/m^2, 25 mCi/m^2, and 31.25 mCi/m^2, all in combination with low dose dexamethasone (40 mg weekly). Of the five patients in the first cohort, four achieved stable disease and one patient progressed at Day 15 after administration and was taken off the study. Of the five patients that have been admitted to the second cohort, four achieved stable disease and one patient progressed at Day 41 after administration and was taken off the study. Four patients were enrolled to the third cohort and all achieved stable disease. In September 2017, we announced results for cohort 4, showing that a single 30-minute infusion of 31.25mCi/m^2 of CLR 131 was safe and tolerated by the three patients in the cohort. Additionally, all three patients experienced clinical benefit with one patient achieving a partial response ("PR"). We use the International Myeloma Working Group (IMWG) definitions of response which involve monitoring the surrogate markers of efficacy, M protein and FLC. The IMWG defines a PR as a greater than or equal to 50% decrease in FLC levels (for patients in whom M protein is unmeasurable) or 50% or greater decrease in M protein. The patient experiencing a PR had an 82% reduction in FLC. This patient did not produce M protein, had received seven prior lines of treatment including radiation, stem cell transplantation and multiple triple combination treatments including one with daratumumab that was not tolerated. One patient experiencing stable disease attained a 44% reduction in M protein. On January 7, 2019, we announced that the pooled median Overall Survival ("mOS") data from the first four cohorts was 22.0 months. In late 2018, we modified this study to evaluate a fractionated dosing strategy to potentially increase efficacy and decrease adverse events.

The first fractionated dose cohort was cohort 5 in which patients received a dose of 15.625 mCi/m^2 administered on day 1 and day 8. Results from cohort 5 indicated enhanced tolerability and safety in comparison to cohort 4 despite an 18% increase in average total dose from 55.29 mCi to 65.15 mCi of CLR 131. Patients in cohort 5 required less supportive care such as transfusions of platelets or packed red blood cells than seen in previous cohorts. Similar to previous cohorts, patients experienced few off-target adverse events, i.e. no peripheral neuropathy, embolisms, gastrointestinal upset, etc. Furthermore, surrogate efficacy markers demonstrated that patients in cohort 5 monitored by M-protein showed a nearly 50% further reduction in M-Protein than seen in cohort 4. Based on these results, on December 4, 2018 the independent Data Monitoring Committee ("IDMC") recommended, advancement to a sixth cohort. Cohort 6 was initiated in late December where patients received two doses of 18.75 mCi/m^2 administered approximately one week apart. On May 15, 2019, we announced that we had received initial results from the Cohort 6 study, which indicated that the 37.5mCi/m^2 fractionated dose was determined to be safe and tolerable by the IDMC. Following the determination, we initiated a Cohort 7 utilizing a 40mCi/m^2 fractionated dose (20mCi/m^2 dose on day 1 and day 8).

Phase 1 Study in R/R Pediatric Patients with Select Solid Tumors, Lymphomas and Malignant Brain Tumors

On December 21, 2017 the Division of Oncology at the FDA accepted our IND and study design for the Phase 1 study of CLR 131 in children and adolescents with select rare and orphan designated cancers. This study was initiated during the first quarter of 2019. On December 14, 2017, we filed an IND application. This study was initiated during the first quarter of 2019. The Phase 1 clinical study of CLR 131 is an open-label, sequential-group, dose-escalation study evaluating the safety and tolerability of intravenous administration of CLR 131 in up to 30 children and adolescents with cancers including neuroblastoma, sarcomas, lymphomas (including Hodgkin's lymphoma) and malignant brain tumors. Secondary objectives of the study are to identify the recommended Phase 2 dose of CLR 131 and to determine preliminary antitumor activity (treatment response) of CLR 131 in children and adolescents. In 2018, the FDA granted orphan drug and a Rare Pediatric Disease Designation ("RPDD") for CLR 131 for the treatment of neuroblastoma, rhabdomyosarcoma, Ewing's sarcoma and osteosarcoma. Should any of these indications reach approval, the RPDD would enable us to receive a priority review voucher. Priority review vouchers can be used by the sponsor to receive priority review for a future New Drug Application ("NDA") or Biologic License Application ("BLA") submission, which would reduce the FDA review time from 12 months to six months. Currently, these vouchers can also be transferred or sold to another entity.

We believe our PDC platform has potential to provide targeted delivery of a diverse range of oncologic payloads, as exemplified by the product candidates listed above, that may result in improvements upon current standard of care ("SOC") for the treatment of a broad range of human cancers.

Preclinical Pipeline

- CLR 1800 Series is a collaborative PDC program with Pierre Fabre that was entered into in December 2015 and was last extended in 2018. Pierre Fabre is the third largest French pharmaceutical company with an extensive oncology research and development infrastructure. The objective of the collaboration was to leverage our expertise in conjugation, linker chemistry and phospholipid ether chemistry to codesign a library of PDCs employing Pierre Fabre's chemotherapeutics. The newly developed PDCs may provide enhanced therapeutic indices to otherwise highly potent, nontargeted payloads through the targeted delivery of the chemotherapeutic payload to cancer cells via our proprietary phospholipid ether delivery platform. The program has been successful in demonstrating improved tolerability and efficacy in multiple animal models. Although our agreement with Pierre Fabre expired in January 2019, the program is still under evaluation by both parties as a number of PDC molecules have the potential to be progressed toward and into IND enabling studies.

- CLR 1900 Series is an internally developed proprietary PDC program leveraging a novel small molecule cytotoxic compound as the payload. The payload inhibits mitosis (cell division) and targets a key pathway required to inhibit rapidly dividing cells that results in apoptosis. We believe that this program could produce a product candidate targeted to select solid tumors. Currently, the program is in preclinical development and if the Company elects to progress any molecules further, we would select a candidate later this year.

- CLR 2000 Series is a collaborative PDC program with Avicenna Oncology, or Avicenna, that we entered into in July 2017. Avicenna is a leading developer of antibody drug conjugates ("ADCs"). The objective of the research collaboration is to design and develop a series of PDCs utilizing Avicenna's proprietary cytotoxic payload. Although Avicenna is a leading developer of ADCs, this collaboration was sought as a means to overcome many of the challenges associated with ADCs, including those associated with the targeting of specific cell surface epitopes. The CLR 2000 series has demonstrated improved safety, efficacy and tissue distribution with the cytotoxic payload. A candidate molecule and a back-up have been selected for further advancement.

- CLR 2100 and 2200 Series are collaborative PDC programs with Onconova Therapeutics, Inc. ("Onconova") that we entered into in September 2017. Onconova is a biotechnology company specializing in the discovery and development of novel small molecule cancer therapies. The collaboration is structured such that we will design and develop a series of PDCs utilizing different small molecules that Onconova was developing as payloads with the intent to show improved targeting and specificity to the tumor. At least one of the molecules was taken into Phase 1 clinical studies previously by Onconova. We would own all new intellectual property associated with the design of the new PDCs, and both companies will have the option to advance compounds.

- CLR 12120 Series is a collaborative PRC program with Orano Med for the development of novel PRCs utilizing Orano Med's unique alpha emitter, lead 212 conjugated to our phospholipid ether (PLE); the companies intend to evaluate the new PDCs in up to three oncology indications. Currently, this series has shown efficacy in the first two animals models tested.

Corporate Information

Our shares are listed on the Nasdaq Capital Market under the symbol "CLRB."

Our principal executive offices are located at 100 Campus Drive, Florham Park, New Jersey 07932. We maintain a website at www.cellectar.com. The information included or referred to on, or accessible through, our website does not constitute part of, and is not incorporated by reference into, this prospectus supplement.

THE OFFERING

Securities offered by us:	1,982,000 shares of our common stock
Shares of common stock outstanding before this offering:	5,396,036 shares
Use of proceeds:	We expect to use the net proceeds received from this offering to fund our research and development activities and for general corporate purposes. For a more complete description of our anticipated use of proceeds from this offering, see "Use of Proceeds."
Risk factors:	Investing in our securities involves a high degree of risk. See the "Risk Factors" section of this prospectus supplement on page S-8 and in the documents we incorporate by reference in this prospectus supplement and the accompanying prospectus for a discussion of factors you should consider carefully before deciding to invest in our securities.
Nasdaq symbol for our common stock:	CLRB
Concurrent Private Placements	In a concurrent private placement, we are selling to the purchasers of shares of our common stock in this offering Series F warrants to purchase an aggregate of 1,982,000 shares of our common stock ("Warrant Shares"). The purchase price attributable to each Warrant Share is equal to $0.125, consistent with the Nasdaq National Market requirements for an "at the market" offering. The Series F warrants are immediately exercisable on the closing date of the offering at an exercise price of $2.40 per share and will expire on the fifth anniversary of the closing date. The Series F warrants and the shares of our common stock issuable upon the exercise of the Series F warrants, are not being offered pursuant to this prospectus supplement and the accompanying prospectus and are being offered pursuant to the exemption provided in Section 4(a)(2) under the Securities Act and Rule 506(b) promulgated thereunder. In a separate concurrent private placement transaction (the "PIPE"), we are selling 2,018,000 shares of common stock together with Series G warrants to purchase an aggregate of up to 2,018,000 shares of common stock. The Series G warrants are immediately exercisable on the closing date of the offering at an exercise price of $2.40 per share and will expire on the fifth anniversary of the closing date. The shares of common stock, the Series G warrants and the shares of our common stock issuable upon the exercise of the Series G warrants, are not being offered pursuant to this prospectus supplement and the accompanying prospectus and are being offered pursuant to the exemption provided in Section 4(a)(2) under the Securities Act and Rule 506(b) promulgated thereunder. See "Private Placement Transaction."
Shares of common stock to be outstanding after this offering (including shares issued in connection with the private placements):	9,396,036 shares

Unless we specifically state otherwise, the share information in this prospectus supplement, including the number of shares of common stock outstanding before this offering, is as of May 15, 2019, and reflects or assumes no exercise of outstanding options or warrants to purchase shares of our common stock.

The number of shares of our common stock outstanding before and after this offering is based on 5,396,036 shares of common stock outstanding as of May 16, 2019, and excludes, as of that date:

- an aggregate of 484,964 shares of common stock issuable upon the exercise of outstanding stock options issued to employees, directors and consultants;
- an aggregate of 537,500 shares of common stock issuable upon the conversion of outstanding shares of Series C preferred stock
- an aggregate of 5,318,747 additional shares of common stock reserved for issuance under outstanding warrants having expiration dates between August 20, 2019, and October 14, 2024, and exercise prices ranging from $4.00 to $468 per share; and
- 1,982,000 shares of our common stock that may be issued upon the exercise of the Series F Warrants issued in this offering and 2,018,000 shares of our common stock that may be issued upon the exercise of the Series G Warrants issued in the PIPE.

RISK FACTORS

An investment in our securities is speculative and involves a high degree of risk. You should carefully consider the risks under the heading "Risk Factors" in our Annual Report on Form 10-K for the fiscal year ended December 31, 2018 filed with the SEC on February 26, 2019, and our Quarterly Report on Form 10-Q for the fiscal quarter ended March 31, 2019, filed with the SEC on May 6, 2019, which information is incorporated by reference in this prospectus supplement, and the additional risks described below and other information in this prospectus supplement, the accompanying prospectus and the documents incorporated by reference herein and therein before deciding to invest in our common stock. If any of the risks described or incorporated by reference into this prospectus supplement actually occur, our business, results of operations, financial condition and cash flows could be materially adversely affected, the trading price of our common stock could decline significantly, and you might lose all or part of your investment. Additional risks and uncertainties that we are unaware of or that we believe are not material at this time could also materially adversely affect our business, financial condition or results of operations. In any case, the value of our securities could decline, and you could lose all or part of your investment, or our use of the offering proceeds may not yield a favorable return on your investment. You should also refer to our financial statements and the notes to those statements, which are incorporated by reference in this prospectus supplement.

Risks Related to this Offering

Our management team will have immediate and broad discretion over the use of the net proceeds from this offering and we may use the net proceeds in ways with which you disagree.

The net proceeds from this offering will be immediately available to our management to use at their discretion. We currently intend to use the net proceeds as discussed under "Use of Proceeds" in this prospectus supplement. We have not allocated specific amounts of the net proceeds from this offering for any other purposes. Accordingly, our management will have significant discretion and flexibility in applying the net proceeds of this offering. You will be relying on the judgment of our management with regard to the use of these net proceeds, and you will not have the opportunity, as part of your investment decision, to assess whether the proceeds are being used appropriately. It is possible that the net proceeds will be invested in a way that does not yield a favorable, or any, return for us or our stockholders. The failure of our management to use such funds effectively could have a material adverse effect on our business, prospects, financial condition, and results of operation.

You will experience immediate and substantial dilution as a result of this offering and may experience additional dilution in the future.

You will incur immediate and substantial dilution as a result of this offering. After giving effect to the sale by us of 1,982,000 shares of common stock at the public offering price of $2.50 per share and 2,018,000 shares of common stock issued under the PIPE at $2.50 per share, and after deducting the placement agent's fee and other estimated offering expenses payable by us, investors in this offering can expect an immediate dilution of $0.42 per share, or 16.8%, at the public offering price based upon 5,096,042 shares outstanding as of March 31, 2019. In addition, in the past, we issued options and warrants to acquire shares of common stock. To the extent these options are ultimately exercised, you will sustain future dilution.

You may experience future dilution as a result of future equity offerings.

In order to raise additional capital, we may in the future 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 in this offering. We may sell shares or other securities in any other offering at a price that is less than the price 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 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 paid by investors in this offering.

USE OF PROCEEDS

Based on an a public offering price of $2.50 per share of common stock and warrant, we estimate that the net proceeds to us from the sale of the securities that we are offering in this offering and the PIPE, will be approximately $9 million, after deducting placement agent fees and estimated offering expenses. In addition, if all of the warrants offered pursuant to this prospectus supplement, the accompanying prospectus and the PIPE are exercised in full for cash, we will receive approximately an additional $9.6 million in cash.

We expect to use any proceeds received from this offering as follows:

- research and development activities, including the further development of CLR 131, and the research advancement of our PDC platform, including product candidates, CLR 1700, CLR 1800, CLR 1900, CLR 2000, CLR 2100, CLR 2200 series.

- general corporate purposes, such as human resource acquisition to support organizational priorities, general and administrative expenses, capital expenditures, working capital, repayment of debt, prosecution and maintenance of our intellectual property, and the potential investment in technologies, products or collaborations that complement our business.

Even if we sell all of the securities subject to this offering, we will still need to obtain additional financing in the future in order to fully fund these product candidates through the regulatory approval process. We may seek such additional financing through public or private equity or debt offerings or other sources, including collaborative or other arrangements with corporate partners, and through government grants and contracts. There can be no assurance we will be able to obtain additional financing. Although we currently anticipate that we will use the net proceeds of this offering as described above, there may be circumstances when a reallocation of funds is necessary. The amounts and timing of our actual expenditures will depend upon numerous factors, including the progress of our development and commercialization efforts, the progress of our clinical studies, whether or not we enter into strategic collaborations or partnerships, and our operating costs and expenditures. Accordingly, our management will have significant flexibility in applying the net proceeds of this offering.

The costs and timing of drug development and regulatory approval, particularly conducting clinical studies, are highly uncertain, subject to substantial risks, and can often change. Accordingly, we may change the allocation of use of these proceeds as a result of contingencies such as the progress and results of our clinical studies and other development activities, the establishment of collaborations, our manufacturing requirements, and regulatory or competitive developments.

Pending the application of the net proceeds as described above or otherwise, we may invest the proceeds in short-term, investment-grade, interest-bearing securities or guaranteed obligations of the U.S. government or other securities.

DILUTION

Our net tangible book value as of March 31, 2019, was approximately $9.9 million, or $1.94 per share of common stock, based upon 5,096,042 shares outstanding. Net tangible book value per share is determined by dividing such number of outstanding shares of common stock into our net tangible book value, which is our total tangible assets, less total liabilities, excluding the derivative liability of $47,000 at that date.

After giving effect to the sale of the securities in this offering and the PIPE at the public offering price of $2.50 per share of common stock and after deducting placement agent fees and other estimated offering expenses payable by us, our adjusted net tangible book value at March 31, 2019, would have been approximately $18.9 million, or $2.08 per share. This represents an immediate increase in net tangible book value of approximately $0.14 per share to our existing stockholders, and an immediate dilution of $0.42 per share to investors purchasing securities in the offering.

The following table illustrates the per share dilution to investors purchasing securities in the offering:

Public offering price per share of common stock		$ 2.50
Net tangible book value per share as of March 31, 2019	$ 1.94	
Increase per share attributable to the sale of securities to investors	$ 0.14	
Adjusted net tangible book value per share after the offering		$ 2.08
Dilution per share to investors in this offering		$ 0.42

The foregoing illustration does not reflect potential dilution from the exercise of outstanding options or warrants to purchase shares of our common stock. The foregoing illustration also does not reflect the dilution that would result from the exercise of the warrants issued in the concurrent private placement.

The information set forth above is based on 5,096,042 shares of common stock outstanding as of March 31, 2019 and excludes, as of that date:

- an aggregate of 484,964 shares of common stock issuable upon the exercise of outstanding stock options issued to employees, directors and consultants;
- an aggregate of 837,500 shares of common stock issuable upon the conversion of outstanding shares of Series C preferred stock
- an aggregate of 5,318,747 additional shares of common stock reserved for issuance under outstanding warrants having expiration dates between August 20, 2019, and October 14, 2024, and exercise prices ranging from $4.00 to $468 per share; and
- 1,982,000 shares of our common stock that may be issued upon the exercise of the Series F Warrants issued in this offering, 2,018,000 shares of our common stock issued in the PIPE, and 2,018,000 shares of our common stock that may be issued upon the exercise of the Series G Warrants issued in the PIPE.

DESCRIPTION OF COMMON STOCK

A description of the common stock we are offering pursuant to this prospectus supplement is set forth under the heading "Description of Capital Stock" beginning on page 7 of the accompanying prospectus. As of May 16, 2019, we had 5,396,036 shares of common stock outstanding.

PRIVATE PLACEMENT TRANSACTIONS

In a concurrent private placement, we are selling to the purchasers of our common stock in this offering Series F warrants to purchase one share of our common stock for each share of common stock purchased in this offering. The purchase price attributable to each Series F warrant is equal to $0.125 for each Warrant Share, consistent with the Nasdaq National Market requirements for an "at the market" offering.

In a separate private placement transaction, the PIPE, we are selling 2,018,000 shares of common stock together with Series G warrants to purchase an aggregate of up to 2,018,000 shares of common stock. The shares of common stock and Series G warrants were priced at $2.50 per fixed combination for an aggregate purchase price of approximately $5.0 million.

The offering and sale of the shares of comment stock, the Series F warrants, the shares of our common stock issuable upon the exercise of the Series F warrants, the Series G warrants and the shares of our common stock issuable upon the exercise of the Series G warrants are not being registered under the Securities Act, are not being offered pursuant to this prospectus supplement and the accompanying prospectus and are being offered pursuant to the exemption provided in Section 4(a)(2) under the Securities Act and Rule 506(b) promulgated thereunder. Accordingly, purchasers may only sell shares acquired in the private placement transactions pursuant to an effective registration statement under the Securities Act covering the resale of those shares, an exemption under Rule 144 under the Securities Act or another applicable exemption under the Securities Act.

Each Series F warrant and Series G warrant is immediately exercisable on the closing date of the offerings at an exercise price of $2.40 per share, subject to adjustment, and will remain exercisable for five (5) years from initial exercise date, but not thereafter. A holder of Series F warrants or Series G warrants will not have the right to exercise any portion of its warrants if the holder, together with its affiliates, would beneficially own in excess of 4.99% (or, at the election of a holder prior to the date of issuance, 9.99%) of the number of shares of our common stock outstanding immediately after giving effect to such exercise, which we refer to as the beneficial ownership limitation; provided, however, that upon 61 days' prior notice to us, the holder may increase or decrease the beneficial ownership limitation, provided that in no event shall the beneficial ownership limitation exceed 9.99% and any increase in the beneficial ownership limitation will not be effective until 61 days following notice of such increase from the holder to us. In addition, the holders of the Series F warrants and Series G warrants will have the right to participate in any rights offering or distribution of assets (such as a spinoff) together with the holders of our common stock on an as-exercised basis.

The exercise price and number of the shares of our common stock issuable upon the exercise of the Series F warrants and Series G warrants will be subject to adjustment in the event of any stock dividends and splits, reverse stock split, stock dividend, recapitalization, reorganization or similar transaction, as described in the Series F warrants and Series G warrants.

The Series F warrants and Series G warrants will be exercisable on a "cashless" basis in certain circumstances. In addition, in the event of a fundamental transaction we or any successor entity will pay at the holder's option, exercisable at any time concurrently with or within 30 days after the consummation of the fundamental transaction, an amount of cash equal to the value of the Series F warrants and Series G warrants as determined in accordance with the Black Scholes option pricing model.

We will be required to file a registration statement on Form S-1 by May 31, 2019 to provide for the resale of the shares of common stock, common stock issuable upon the exercise of the Series F warrants and common stock issuable upon the exercise of the Series G warrants, and will be obligated to use our reasonable best efforts to keep such registration statement effective from the date the Series F warrants and Series G warrants initially become exercisable until the earlier of (i) the date on which the shares of common stock, common stock issuable upon the exercise of the Series F warrants and common stock issuable upon exercise of the Series G warrants may be sold without registration pursuant to Rule 144 under the Securities Act, and (ii) the date on which all of the shares of common stock, common stock issuable upon the exercise of the Series F warrants and common stock issuable upon exercise of the Series G warrants have been sold under the registration statement or pursuant to Rule 144 under the Securities Act or any other rule of similar effect.

PLAN OF DISTRIBUTION

Roth Capital Partners, LLC, which we refer to as the placement agent, has agreed to act as our exclusive placement agent in connection with this offering subject to the terms and conditions of the placement agency agreement dated May 16, 2019. The placement agent is not purchasing or selling any of the shares of our common stock offered by this prospectus supplement. Therefore, we have entered into a securities purchase agreement directly with investors in connection with this offering. We will make offers only to a limited number of institutional accredited investors. Roth Capital Partners, LLC is also acting as placement agent for the private placement transaction.

We have agreed to indemnify the placement agent against specified liabilities, including liabilities under the Securities Act, and to contribute to payments the placement agent may be required to make in respect thereof.

Fees and Expenses

We have agreed to pay the placement agent a placement agent's fee equal to 7.5% of the aggregate purchase price of the shares of our common stock sold in this offering. The following table shows the per share and total cash placement agent's fees we will pay to the placement agent in connection with the sale of the shares of our common stock offered pursuant to this prospectus supplement and the accompanying prospectus.

	Per Share of Common Stock	Total
Public offering price	$ 2.50	$ 4,955,000
Placement agent fees[(1)]	$ 0.1875	$ 371,625
Proceeds to us (before expenses)	$ 2.3125	$ 4,583,375

(1) We have also agreed to reimburse the placement agent for certain expenses. See below.

In addition, we have agreed to reimburse the placement agent at closing up to a maximum aggregate of $100,000 for actual expenses incurred by it in connection with this offering.

We have agreed to indemnify the placement agent and specified other persons against certain liabilities relating to or arising out of the placement agent's activities under the placement agency agreement and to contribute to payments that the placement agent may be required to make in respect of such liabilities.

The placement agent may be deemed to be an underwriter within the meaning of Section 2(a)(11) of the Securities Act, and any commissions received by it and any profit realized on the resale of the shares sold by it while acting as principal might be deemed to be underwriting discounts or commissions under the Securities Act. As an underwriter, the placement agent would be required to comply with the requirements of the Securities Act and the Exchange Act, including, without limitation, Rule 415(a)(4) under the Securities Act and Rule 10b-5 and Regulation M under the Exchange Act. These rules and regulations may limit the timing of purchases and sales of shares by the placement agent acting as principal. Under these rules and regulations, the placement agent:

- may not engage in any stabilization activity in connection with our securities; and
- may not bid for or purchase any of our securities or attempt to induce any person to purchase any of our securities, other than as permitted under the Exchange Act, until it has completed its participation in the distribution.

Our common stock is listed on The Nasdaq Capital Market under the symbol "CLRB".

EXPERTS

The audited financial statements incorporated by reference in this prospectus supplement, the accompanying prospectus and elsewhere in the registration statement have been so incorporated by reference in reliance upon the report of Baker Tilly Virchow Krause, LLP, independent registered public accountants, upon the authority of said firm as experts in accounting and auditing.

LEGAL MATTERS

The legality of the securities offered hereby will be passed upon for us by Michael Best & Friedrich LLP of Madison, Wisconsin. Ellenoff Grossman & Schole LLP, New York, New York acted as counsel for the placement agent.

WHERE YOU CAN FIND MORE INFORMATION

We are a reporting company and file annual, quarterly and special reports, and other information with the Securities and Exchange Commission. Copies of the reports and other information may be read and copied at the SEC's Public Reference Room at 100 F Street NE, Washington, D.C. 20549. You can request copies of such documents by writing to the SEC and paying a fee for the copying cost. You may obtain information on the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330. The SEC maintains a web site at http://www.sec.gov that contains reports, proxy and information statements and other information regarding registrants that file electronically with the SEC.

INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

The SEC allows us to "incorporate by reference" information into this prospectus supplement. This means that we can disclose important information to you by referring you to another document filed separately with the SEC. The information incorporated by reference is considered to be a part of this prospectus supplement, except for any information that is superseded by information that is included directly in this prospectus supplement or incorporated by reference subsequent to the date of this prospectus supplement. We do not incorporate the contents of our website into this prospectus supplement. This prospectus supplement incorporates by reference the documents listed below that we have previously filed with the SEC. They contain important information about us and our financial condition. The following documents are incorporated by reference into this prospectus supplement:

- our Annual Report on Form 10-K for the fiscal year ended December 31, 2018, filed with the SEC on February 26, 2019;
- our Quarterly Report on Form 10-Q for the quarterly period ended March 31, 2019, filed with the SEC on May 6, 2019;
- our Definitive Proxy Statement on Schedule 14A, filed with the SEC on April 29, 2019;
- our Current Report on Form 8-K, filed with the SEC on February 15, 2019;
- our Current Report on Form 8-K, filed with the SEC on March 8, 2019;
- our Current Report on Form 8-K, filed with the SEC on March 19, 2019;
- our Current Report on Form 8-K, filed with the SEC on April 19, 2019; and
- the description of our securities contained in our Registration Statement on Form 8-A filed on August 14, 2014, including any amendment or report filed for the purpose of updating such description.

In addition, we incorporate by reference all documents that we may file with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act on or after the date of this prospectus supplement until the date on which this registration statement has been withdrawn. These documents will become a part of this prospectus supplement from the date that the documents are filed with the SEC. These documents include periodic reports, such as annual reports on Form 10-K, quarterly reports on Form 10-Q and current reports on Form 8-K, excluding any information filed or furnished pursuant to Item 2.02, Item 7.01 or Item 9.01 and excluding any information furnished pursuant to Item 8.01 of any current report on Form 8-K solely for purposes of satisfying the requirements of Regulation FD under the Securities Exchange Act unless such Form 8-K expressly provides to the contrary.

Upon oral or written request and at no cost to the requester, we will provide to each person, including any beneficial owner, to whom a prospectus is delivered, a copy of any or all of the information that has been incorporated by reference in this prospectus supplement but not delivered with this prospectus supplement. You may request copies of these filings, at no cost, by writing to us at Cellectar Biosciences, Inc., 100 Campus Drive, Florham Park, New Jersey 07932 Attention: Chief Financial Officer.

Any statement contained herein or in a document incorporated or deemed to be incorporated by reference herein shall be deemed to be modified or superseded for purposes of this prospectus supplement and the accompanying prospectus to the extent that a statement contained herein or therein, in any other subsequently filed document that also is or is deemed to be incorporated by reference herein and in any accompanying prospectus supplement, modifies or supersedes such statement. Any statement so modified or superseded shall not be deemed, except as so modified and superseded, to constitute a part of this prospectus supplement.

Any statement made in this prospectus supplement and the accompanying prospectus concerning the contents of any contract, agreement or other document is only a summary of the actual contract, agreement or other document. If we have filed or incorporated by reference any contract, agreement or other document as an exhibit to the registration statement, you should read the exhibit for a more complete understanding of the document or matter involved. Each statement regarding a contract, agreement or other document is qualified by reference to the actual document.

This prospectus supplement and the accompanying prospectus are part of a registration statement on Form S-3 that we filed with the SEC under the Securities Act. This prospectus supplement does not contain all of the information contained in the registration statement. For further information about us and our securities, you should read the prospectus and the exhibits filed with the registration statement, as well as all prospectus supplements.

Prospectus

$50,000,000

Common Stock
Preferred Stock
Warrants
Units
Subscription Rights

Cellectar Biosciences, Inc. ("we," "us" or the "Company") may from time to time offer to sell any combination of the securities described in this prospectus, in one or more offerings. The aggregate initial offering price of all securities sold under this prospectus will not exceed $50,000,000.

This prospectus provides a general description of the securities we may offer. Each time we sell securities, we will provide specific terms of the securities offered in a supplement to this prospectus. We may also authorize one or more free writing prospectuses to be provided to you in connection with these offerings. The prospectus supplement and any related free writing prospectus may also add, update or change information contained in this prospectus. You should carefully read this prospectus, the applicable prospectus supplement and any related free writing prospectus, as well as any documents incorporated by reference herein or therein before you invest in any securities.

This prospectus may not be used to consummate a sale of any securities unless accompanied by a prospectus supplement.

Our common stock is traded on the Nasdaq Capital Market under the symbol CLRB. On May 31, 2017, the last reported sale price for our common stock was $1.74 per share. The aggregate market value of our outstanding common stock held by non-affiliates, or public float, as of the date of this prospectus is approximately $27.7 million based on 12,773,385 shares of outstanding common stock held by non-affiliates, and a per share price of $2.17, which was the last reported sale price of our common stock on the Nasdaq Capital Market on April 7, 2017 (a date within 60 days of the date hereof). Pursuant to General Instruction I.B.6 of Form S-3, in no event will we sell securities registered on the registration statement of which this prospectus is a part in a public primary offering with a value exceeding more than one-third of our public float in any 12-month period if our public float, measured in accordance with such instruction, remains below $75.0 million. As of the date hereof, we have not offered any securities pursuant to General Instruction I.B.6 of Form S-3 during the 12 calendar months prior to and including the date of this prospectus. The applicable prospectus supplement will contain information, where applicable, as to any other listing on the Nasdaq Capital Market or any securities market or other exchange of the securities, if any, covered by the prospectus supplement.

At no time will we issue shares of common stock (whether upon conversion or exercise of warrants, preferred stock, units or subscription rights) in a transaction other than a public offering if such transaction would result in the issuance of more than 19.999% of the amount of common stock issued and outstanding for less than the greater of book or market value of the common stock unless (i) our stockholders have approved the issuance of shares of common stock in excess of 20%, or (ii) Nasdaq has provided a waiver of Listing Rule 5635(d).

We may sell these securities directly to investors, through agents designated from time to time or to or through underwriters or dealers. For additional information on the methods of sale, you should refer to the section entitled "Plan of Distribution" in this prospectus. If any underwriters are involved in the sale of any securities with respect to which this prospectus is being delivered, the names of such underwriters and any applicable commissions or discounts will be set forth in a prospectus supplement. The price to the public of such securities and the net proceeds we expect to receive from such sale will also be set forth in a prospectus supplement.

Investing in our securities involves a high degree of risk. See "Risk Factors" beginning on page 6.

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

The date of this prospectus is September 20, 2017.

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ABOUT THIS PROSPECTUS

This prospectus is a part of a registration statement that we filed with the Securities and Exchange Commission (the "SEC") utilizing a "shelf" registration process. Under this shelf registration process, we may sell any combination of the securities described in this prospectus in one or more offerings up to a total dollar amount of $50,000,000. This prospectus provides you with a general description of the securities we may offer. Each time we sell securities under this shelf registration, we will provide a prospectus supplement that will contain specific information about the terms of that offering. We may also authorize one or more free writing prospectuses to be provided to you that may contain material information relating to these offerings. The prospectus supplement and any related free writing prospectus that we may authorize to be provided to you may also add, update or change information contained in this prospectus or in any documents that we have incorporated by reference into this prospectus. You should read this prospectus, any applicable prospectus supplement and any related free writing prospectus, together with the information incorporated herein by reference as described under the heading "Where You Can Find Additional Information."

You should rely only on the information that we have provided or incorporated by reference in this prospectus, any applicable prospectus supplement and any related free writing prospectus that we may authorize to be provided to you. We have not authorized any dealer, salesman or other person to give any information or to make any representation other than those contained or incorporated by reference in this prospectus, any applicable prospectus supplement or any related free writing prospectus that we may authorize to be provided to you. You must not rely upon any information or representation not contained or incorporated by reference in this prospectus, the accompanying prospectus supplement or related free writing prospectus. 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, the accompanying supplement to this prospectus and any related free writing prospectus, if any, do not constitute an offer to sell or the solicitation of an offer to buy any securities other than the registered securities to which they relate, nor do this prospectus, the accompanying supplement to this prospectus or any related free writing prospectus, if any, constitute an offer to sell or the solicitation of an offer to buy securities in any jurisdiction to any person to whom it is unlawful to make such offer or solicitation in such jurisdiction. You should not assume that the information contained in this prospectus, any applicable prospectus supplement or any related free writing prospectus is accurate on any date subsequent to the date set forth on the front of the document or that any information we have incorporated by reference therein is correct on any date subsequent to the date of the document incorporated by reference, even though this prospectus, any applicable prospectus supplement or any related free writing prospectus is delivered or the applicable securities are sold on a later date.

SUMMARY

This summary highlights selected information from this prospectus and the documents incorporated herein by reference and does not contain all of the information that you need to consider in making your investment decision. You should carefully read the entire prospectus, including the risks of investing in our securities discussed under "Risk Factors" beginning on page 6 of this prospectus, the information incorporated herein by reference, including our financial statements, and the exhibits to the registration statement of which this prospectus is a part. All references in this prospectus to "we," "us," "our," the "Company" and similar designations refer to Cellectar Biosciences, Inc. and its consolidated subsidiary, unless otherwise indicated or as the context otherwise requires.

Business Overview

We are a clinical stage biopharmaceutical company focused on the development of targeted phospholipid drug conjugates (PDCs) for the treatment and imaging of cancer. Our research and development program is based on its proprietary PDC cancer targeting delivery platform. The delivery platform possesses the potential for the discovery and development of a broad range of cancer targeting agents. Our pipeline is comprised of pre-clinical and clinical product candidates including radiotherapeutic and chemotherapeutic PDC's. The pipeline also includes diagnostic and optical imaging assets. Our research and development resources are focused on the clinical advancement of its therapeutic PDC's.

Our core company strategy is to leverage our industry leading PDC, proprietary cancer targeting delivery platform to generate capital, supplement internal resources and accelerate and broaden product candidate clinical development through strategic asset and research collaborations.

Our shares are listed on the Nasdaq Capital Market under the symbol CLRB; prior to August 15, 2014, our shares were quoted on the OTCQX marketplace, and prior to February 12, 2014 were quoted under the symbol NVLT.

Our PDC platform is based on our cancer-targeting and delivery technology which provides selective delivery of a diverse range of oncologic payloads to cancer cells and cancer stem cells. By linking various drug payloads to our proprietary phospholipid ether cancer-targeting vehicle, we believe we can create PDCs with the potential to provide highly targeted delivery of chemotherapeutic and radiotherapeutic payloads to a broad range of cancers. As a result, our PDC platform has the potential to improve the therapeutic index of drug payloads and enhancing or maintaining efficacy while minimizing the off-target and toxic side effects that frequently occur with typical cancer therapies. The Company is currently focused on the development of its lead therapeutic product candidate, CLR 131. Additionally, the Company is executing the pre-clinical evaluation and development of its CLR CTX Chemotherapeutic PDC program with both internal and external resources.

- CLR 131 is a small-molecule, cancer-targeting radiotherapeutic PDC that is designed to deliver cytotoxic (cell-killing) radiation directly and selectively to cancer cells and cancer stem cells. CLR 131 is our lead therapeutic PDC product candidate and is currently being evaluated in both Phase 1 and Phase 2 clinical studies. The Phase 1 clinical study is a standard three by three dose escalation safety study in patients with relapse or refractory multiple myeloma. Multiple myeloma is the second most common hematologic cancer and an incurable cancer of plasma cells. This cancer type was selected for clinical, regulatory and commercial rationales, including multiple myeloma's highly radiosensitive nature, and continued unmet medical need in the relapse/refractory setting. The primary goals of the Phase 1 study are to assess the compound's safety and tolerability in patients with relapsed or refractory multiple myeloma. Secondary objectives includes establishment of a recommended Phase 2 dose, both with and without dexamethasone, as well as an assessment of therapeutic activity, including surrogate efficacy markers, progression free survival (PFS) and overall survival. The Investigational New Drug (IND) application was accepted by the U.S. Food and Drug Administration (FDA) in March 2014. In December 2014, the FDA granted orphan drug designation for CLR 131 for the treatment of multiple myeloma. The Phase 1 study was initiated in April 2015 and we announced favorable safety results from the first patient cohort in January 2016. The study's Data Monitoring Committee (DMC), unanimously agreed to allow us to increase the dose of CLR 131 by 50% and advance into the second cohort. The DMC reviewed Cohort 2 patient safety data in September 2016, and unanimously agreed to allow us to increase the dose by 33% and advance to Cohort 3. In February 2017, the DMC unanimously determined the safety profile was again favorable in Cohort 3 and that it was acceptable to advance into Cohort 4 with an increase in dose by 20%. Surrogate markers of efficacy, including M protein, Free Light Chain (FLC), Progression Free Survival (PFS), and Overall Survival (OS), are also captured as secondary objectives of this Phase 1 study. In July 2016, the Company was awarded a $2,000,000 National Cancer Institute Fast-Track Small Business Innovation Research (SBIR) grant to further advance CLR 131. The funds are supporting a Phase 2 study the Company initiated in March 2017 to further define the clinical benefits of CLR 131 in multiple myeloma and other rare hematologic malignancies.

- The Company is exploring the creation of additional PDCs ranging from newly discovered to well-characterized chemotherapeutic payloads under its CLR CTX Chemotherapeutic PDC program. The objective of our CTX program is to develop PDC chemotherapeutics through conjugation of our delivery vehicle and non-targeted anti-cancer agents to improve therapeutic indices and expand potential indications through the targeted delivery of chemotherapeutic payloads. Initial CTX product candidates include CLR 1601-PTX, CLR 1602-PTX and CLR 1603-PTX; all are small-molecule, cancer-targeting chemotherapeutics in pre-clinical research. These PDCs are designed to selectively deliver paclitaxel, a chemotherapeutic payload to cancer cells and cancer stem cells increasing the therapeutic index of paclitaxel as a monotherapy. Each of our paclitaxel PDC's have been evaluated *in vitro* to demonstrate formulation stability and CLR 1602-PTX is currently being studied *in vivo* to further explore the PDC's cancer targeting selectivity. In December of 2015, the Company entered into a research collaboration for our PDC technology with Pierre Fabre laboratories, the third largest French pharmaceutical company. In October 2017, we extended this research collaboration. The objective of the research collaboration is to co-design a library of PDC's employing Pierre Fabre's chemotherapeutics in combination with our proprietary cancer targeting delivery vehicle. The newly developed PDC's may provide enhanced therapeutic indices to otherwise highly potent, non-targeted payloads through the targeted delivery to cancer cells provided by our cancer targeted delivery vehicle.

- LR 125 is a cancer-targeting radiotherapeutic currently under pre-clinical investigation for the treatment of micrometastatic disease. Similar to CLR 131, the selective uptake and retention of CLR 125 has been observed in malignant tissues during pre-clinical studies. Preclinical evaluation of this molecule was completed in June 2016 as part of the Phase 1 portion of an NCI SBIR award and demonstrated favorable biodistribution, tolerability, and dose response.

The Company's product pipeline also includes a diagnostic imaging agent, CLR 124, a Phase 2-ready asset, as well as our 1500 series of optical imaging agents, including 1502, a Phase 1-ready asset. Although these are intriguing and potentially clinically useful compounds, at this time the Company has prioritized the development of its therapeutic assets.

We believe our PDC platform has potential to provide targeted delivery of a diverse range of oncologic payloads, as exemplified by the product candidates listed above, that may result in improvements upon current standard of care (SOC) for the treatment of a broad range of human cancers.

For more information regarding the material risks and uncertainties we face, please see "Risk Factors" beginning on page 6 of this prospectus.

Corporate Information

Our headquarters and manufacturing operation is located at 3301 Agriculture Drive, Madison, Wisconsin 53716 and the telephone number at that address is (608) 441-8120. We maintain a website at www.cellectar.com. The information included or referred to on, or accessible through, our website does not constitute part of, and is not incorporated by reference into, this prospectus.

Securities We May Offer

We may offer shares of our common stock and preferred stock, various series of warrants to purchase any of such securities, either individually or in units and/or subscription rights, from time to time under this prospectus, together with any applicable prospectus supplement and related free writing prospectus, at prices and on terms to be determined by market conditions at the time of offering. This prospectus provides you with a general description of the securities we may offer. Each time we offer a type or series of securities, we will provide a prospectus supplement that will describe the specific amounts, prices and other important terms of the securities, including, to the extent applicable:

- designation or classification;
- aggregate principal amount or aggregate offering price;
- rates and times of payment of dividends, if any;
- redemption, conversion or exchange terms, if any;
- conversion or exchange prices or rates, if any, and, if applicable, any provisions for changes to or adjustments in the conversion or exchange prices or rates and in the securities or other property receivable upon conversion or exchange;
- ranking;
- restrictive covenants, if any;
- voting or other rights, if any; and
- important United States federal income tax considerations.

A prospectus supplement and any related free writing prospectus that we may authorize to be provided to you may also add, update or change information contained in this prospectus or in documents we have incorporated by reference. However, no prospectus supplement or free writing prospectus will offer a security that is not registered and described in this prospectus at the time of the effectiveness of the registration statement of which this prospectus is a part.

We may sell the securities directly to or through underwriters, dealers or agents. We, and our underwriters or agents, reserve the right to accept or reject all or part of any proposed purchase of securities. If we do offer securities through underwriters or agents, we will include in the applicable prospectus supplement:

- the names of those underwriters or agents;
- applicable fees, discounts and commissions to be paid to them;
- details regarding over-allotment options, if any; and
- the net proceeds to us.

Common Stock

We may offer shares of our common stock, par value $0.00001 per share, either alone or underlying other registered securities convertible into or exercisable for our common stock. Holders of our common stock are entitled dividends as the Board of Directors of the Company (the "Board") may declare from time to time out of legally available funds, subject to the preferential rights of the holders of any shares of our preferred stock that are outstanding or that we may issue in the future. Currently, we do not have any issued and outstanding preferred stock. Each holder of our common stock is entitled to one vote per share. In this prospectus, we provide a general description of, among other things, our dividend policy and the rights and restrictions that apply to holders of our common stock. Our common stock is described in greater detail in this prospectus under "Description of Capital Stock — Common Stock."

Preferred Stock

We may issue shares of preferred stock, par value $0.00001 per share, in one or more classes or series. Our Board or a committee designated by our Board will determine the dividend, voting and conversion rights and other provisions at the time of sale. The particular terms of each class or series of preferred stock, including redemption privileges, liquidation preferences, voting rights, dividend rights and/or conversion rights, will be more fully described in the applicable prospectus supplement relating to the preferred stock offered thereby. Our preferred stock is described in greater detail in this prospectus under "Description of Capital Stock — Preferred Stock."

Warrants

We may from time to time offer warrants for the purchase of our common stock and/or preferred stock in one or more series. We may issue warrants independently or together with common stock and/or preferred, and the warrants may be attached to or separate from those securities. The warrants may be evidenced by warrant certificates issued under one or more warrant agreements, which are contracts between us and an agent for the holders of the warrants. In this prospectus, we have summarized certain general features of the warrants under "Description of Warrants." We urge you, however, to read the prospectus supplements and any free writing prospectus that we may authorize to be provided to you related to the series of warrants being offered, as well as the complete warrant agreements and warrant certificates that contain the terms of the warrants. Specific warrant agreements will contain additional important terms and provisions and will be incorporated by reference as an exhibit to the registration statement which includes this prospectus.

Units

We may offer units consisting of common stock, preferred stock, and/or warrants to purchase any of such securities in one or more series. In this prospectus, we have summarized certain general features of the units under "Description of Units." We urge you, however, to read the prospectus supplements and any free writing prospectus that we may authorize to be provided to you related to the series of units being offered, as well as the unit agreements that contain the terms of the units. We will evidence each series of units by unit certificates that we will issue under a separate agreement. We will enter into the unit agreements with a unit agent. Each unit agent will be a bank or trust company that we select. We will indicate the name and address of the unit agent in the applicable prospectus supplement relating to a particular series of units. The specific form of unit agreement and any supplemental agreements that describe the terms of the series of units we are offering before the issuance of the related series of units will be incorporated by reference as an exhibit to the registration statement which includes this prospectus.

Subscription Rights

We may issue subscription rights to purchase common stock, preferred stock or other securities described in this prospectus or any combination thereof. In this prospectus, we have summarized certain general features of the units under "Description of Subscription Rights." These subscription rights may be issued independently or together with any other security offered by us and may or may not be transferable by the securityholder receiving the subscription rights in such offering. In connection with any offering of subscription rights, we may enter into a standby arrangement with one or more underwriters or other investors pursuant to which the underwriters or other investors may be required to purchase any securities remaining unsubscribed for after such offering. The specific form of subscription rights agreement and any supplemental agreements that describe the terms of the subscription rights we are offering before the issuance of the related subscription rights will be incorporated by reference as an exhibit to the registration statement which includes this prospectus.

RISK FACTORS

Investment in our securities involves a high degree of risk. Prior to making a decision about investing in our securities, prospective investors should consider carefully all of the information included and incorporated by reference or deemed to be incorporated by reference in this prospectus or the applicable prospectus supplement, including the risk factors incorporated by reference herein from our Annual Report on Form 10-K for the fiscal year ended December 31, 2016, as updated by annual, quarterly and other reports and documents we file with the SEC after the date of this prospectus and that are incorporated by reference herein or in the applicable prospectus supplement. Each of these risk factors could have a material adverse effect on our business, results of operations, financial position or cash flows, which may result in the loss of all or part of your investment. For more information, see "Where You Can Find Additional Information" and "Incorporation of Certain Information by Reference."

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus and the documents incorporated by reference herein contain, or will contain, "forward-looking statements" within the meaning of Section 27A of the Securities Act and Section 21E of the Securities Exchange Act of 1934 (the "Exchange Act"), which include statements that express plans, anticipation, intent, contingency, goals, targets or future development and/or otherwise are not statements of historical fact. These statements are based on our management's current beliefs, expectations and assumptions about future events, conditions and results and on information currently available to us. Discussions containing these forward-looking statements may be found, among other places, in the Sections entitled "Business," "Risk Factors" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" incorporated by reference from our most recent Annual Report on Form 10-K and in our Quarterly Reports on Form 10-Q, as well as any amendments thereto, filed with the SEC.

In some cases, you can identify forward-looking statements by terminology, such as "expects," "anticipates," "intends," "estimates," "plans," "believes," "seeks," "may," "should", "could" or the negative of such terms or other similar expressions, but these are not the exclusive means of identifying forward-looking statements. Forward-looking statements involve estimates, assumptions and uncertainties that could cause actual results to differ materially from those expressed in them. Any forward-looking statements are qualified in their entirety by reference to the factors discussed throughout this prospectus. Such statements are subject to various risks, uncertainties and assumptions that could cause actual results to differ materially from those anticipated or implied in our forward-looking statements due to a number of factors including, but not limited to, those set forth above under the section entitled "Risk Factors" in this prospectus and any accompanying prospectus supplement. Given these risks, uncertainties and other factors, many of which are beyond our control, you should not place undue reliance on these forward-looking statements.

Except as required by law, we assume no obligation to update these forward-looking statements publicly, or to revise any forward-looking statements to reflect events or developments occurring after the date of this prospectus, even if new information becomes available in the future.

USE OF PROCEEDS

Unless we specify otherwise in a prospectus supplement, we intend to use the net proceeds from our sale of the securities under this prospectus for general corporate purposes, which may include making additions to our working capital, funding future acquisitions, or for any other purpose we describe in the applicable prospectus supplement.

We have not yet determined the amount of net proceeds to be used specifically for any of the foregoing purposes. Accordingly, our management will have broad discretion over the uses of such proceeds. The specific allocations of the proceeds we receive from the sale of our securities will be described in the applicable prospectus supplement.

DESCRIPTION OF SECURITIES WE MAY OFFER

We may offer shares of our common stock and preferred stock, various series of warrants to purchase any of such securities, either individually or in units and/or subscription rights, from time to time under this prospectus, together with any applicable prospectus supplement and related free writing prospectus, at prices and on terms to be determined by market conditions at the time of offering. This prospectus provides you with a general description of the securities we may offer. Each time we offer a type or series of securities, we will provide a prospectus supplement that will describe the specific amounts, prices and other important terms of the securities. We may offer up to $50,000,000 of securities under this prospectus.

DESCRIPTION OF CAPITAL STOCK

The following description of our common stock and preferred stock, together with any additional information we include in any applicable prospectus supplement or any applicable free writing prospectus, summarizes the material terms and provisions of our common stock and the preferred stock that we may offer under this prospectus. While the terms we have summarized below will apply generally to any future common stock or preferred stock that we may offer, we will describe the particular terms of any class or series of these securities in more detail in the applicable prospectus supplement. The following summary description of our common stock is based on the provisions of our Second Amended and Restated Certificate of Incorporation, as amended, which we refer to as our certificate of incorporation, our by-laws, and the applicable provisions of the Delaware General Corporation Law, which we refer to as the DGCL. This description may not contain all of the information that is important to you and is subject to, and is qualified in its entirety by reference to our certificate of incorporation, our by-laws and the applicable provisions of the DGCL. Our certificate of incorporation and our by-laws are incorporated by reference into the registration statement of which this prospectus is a part or may be incorporated by reference in this prospectus or any applicable prospectus supplement.

Authorized and Outstanding Capital Stock

Our authorized capital stock consists of 80,000,000 shares of common stock, $0.00001 par value per share and 7,000 shares of preferred stock, $0.00001 par value per share. Our certificate of incorporation authorizes us to issue shares of our preferred stock from time to time in one or more series without stockholder approval, each such series to have rights and preferences, including voting rights, dividend rights, conversion rights, redemption privileges and liquidation preferences as our Board may determine. The rights of the holders of common stock will be subject to, and may be adversely affected by, the rights of holders of any preferred stock that we may issue in the future. The issuance of preferred stock, while providing desirable flexibility in connection with possible acquisitions and other corporate purposes, could have the effect of making it more difficult for others to acquire, or of discouraging others from attempting to acquire, a majority of our outstanding voting stock.

As of May 31, 2017, we had 13,462,170 shares of common stock outstanding and no shares of preferred stock outstanding. All outstanding shares of our common stock are duly authorized, validly issued, fully paid and non-assessable.

Common Stock

Voting. Holders of our common stock are entitled to one vote per share held of record on all matters to be voted upon by our stockholders. Our common stock does not have cumulative voting rights. Persons who hold a majority of the outstanding common stock entitled to vote on the election of directors can elect all of the directors who are eligible for election.

Dividends. Subject to preferences that may be applicable to the holders of any outstanding shares of our preferred stock, the holders of our common stock are entitled to receive such lawful dividends as may be declared by our Board.

Liquidation and Dissolution. In the event of our liquidation, dissolution or winding up, and subject to the rights of the holders of any outstanding shares of our preferred stock, the holders of shares of our common stock will be entitled to receive pro rata all of our remaining assets available for distribution to our stockholders.

Other Rights and Restrictions. Our certificate of incorporation prohibits us from granting preemptive rights to any of our stockholders.

All of the outstanding shares of our common stock are, and the shares of common stock issued upon the conversion of any securities convertible into our common stock will be, fully paid and non-assessable. The shares of common stock offered by this prospectus or upon the conversion of any preferred stock or exercise of any warrants offered pursuant to this prospectus, when issued and paid for, will also be, fully paid and non-assessable.

Our common stock is listed on the Nasdaq Capital Market under the symbol CLRB. The transfer agent and registrar for our common stock is American Stock Transfer & Trust Company.

Preferred Stock

We are authorized to issue 7,000 shares of preferred stock, none of which were issued and outstanding as of May 31, 2017. Our Board is authorized, without action by our stockholders, to classify or reclassify any unissued portion of our authorized shares of preferred stock to provide for the issuance of shares of other classes or series, including preferred stock in one or more series. Our Board may fix or alter the dividend rights, dividend rate, conversion rights, voting rights, rights and terms of redemption, the redemption price or prices, the liquidation preferences of any wholly unissued series of Preferred Stock, and the number of shares constituting any such series and the designation thereof, or any of them; and to increase or decrease the number of shares of any series subsequent to the issue of shares of that series, but not below the number of shares of such series then outstanding. In case the number of shares of any series shall be so decreased, the shares constituting such decrease shall resume the status which they had prior to the adoption of the resolution originally fixing the number of shares of such series.

The particular terms of each class or series of preferred stock that we may offer under this prospectus, including redemption privileges, liquidation preferences, voting rights, dividend rights and/or conversion rights, will be more fully described in the applicable prospectus supplement relating to the preferred stock offered thereby. The rights, preferences, privileges and restrictions of the preferred stock of each series will be fixed by the certificate of designation relating to each series. We will incorporate by reference into the registration statement of which this prospectus is a part the form of any certificate of designation that describes the terms of the series of preferred stock we are offering before the issuance of the related series of preferred stock. The applicable prospectus supplement will specify the terms of the series of preferred stock we may offer, including, but not limited to:

- the distinctive designation and the maximum number of shares in the series;
- the number of shares we are offering and purchase price per share;
- the liquidation preference, if any;
- the terms on which dividends, if any, will be paid;
- the voting rights, if any, on the shares of the series;
- the terms and conditions, if any, on which the shares of the series shall be convertible into, or exchangeable for, shares of any other class or classes of capital stock;
- the terms on which the shares may be redeemed, if at all;
- any listing of the preferred stock on any securities exchange or market;
- a discussion of any material or special United States federal income tax considerations applicable to the preferred stock; and
- any or all other preferences, rights, restrictions, including restrictions on transferability, and qualifications of shares of the series.

The issuance of preferred stock may delay, deter or prevent a change in control.

The description of preferred stock above and the description of the terms of a particular series of preferred stock in any applicable prospectus supplement are not complete. You should refer to the applicable certificate of designation for complete information.

The DGCL provides that the holders of preferred stock will have the right to vote separately as a class on any proposal involving fundamental changes in the rights of holders of that preferred stock. This right is in addition to any voting rights that may be provided for in the applicable certificate of designation.

Possible Anti-Takeover Effects of Delaware Law and our Certificate of Incorporation and By-laws

Authorized but Unissued Stock. We have shares of common stock and preferred stock available for future issuance, in some cases without stockholder approval. We may issue these additional shares for a variety of corporate purposes, including public offerings to raise additional capital, corporate acquisitions, stock dividends on our capital stock or equity compensation plans. The existence of unissued and unreserved common stock and preferred stock may enable our Board to issue shares to persons friendly to current management or to issue preferred stock with terms that could render more difficult or discourage a third-party attempt to obtain control of us, thereby protecting the continuity of our management. In addition, if we issue preferred stock, the issuance 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.

Amendments to By-laws. Our certificate of incorporation and by-laws authorize the Board to amend, repeal, alter or rescind the by-laws at any time without stockholder approval. Allowing the Board to amend our by-laws without stockholder approval enhances Board control over our by-laws.

Classification of Board; Removal of Directors; Vacancies. Our certificate of incorporation provide for the division of the Board into three classes as nearly equal in size as possible with staggered three-year terms; that directors may be removed only for cause by the affirmative vote of the holders of two-thirds of our shares of capital stock entitled to vote; and that any vacancy on the Board, however occurring, including a vacancy resulting from an enlargement of the Board, may be filled only by the vote of a majority of the directors then in office. The limitations on the removal of directors and the filling of vacancies could have the effect of making it more difficult for a third party to acquire, or of discouraging a third party from acquiring, control of us. Our certificate of incorporation requires the affirmative vote of the holders of at least 75% of our shares of capital stock issued and outstanding and entitled to vote to amend or repeal any of these provisions.

Notice Periods for Stockholder Meetings. Our by-laws provide that for business to be brought by a stockholder before an annual meeting of stockholders, the stockholder must give written notice to the corporation not less than 90 nor more than 120 days prior to the one year anniversary of the date of the annual meeting of stockholders of the previous year; provided, however, that in the event that the annual meeting of stockholders is called for a date that is not within 30 days before or after such anniversary date, notice by the stockholder must be received not later than the close of business on the tenth day following the day on which the corporation's notice of the date of the meeting is first given or made to the stockholders or disclosed to the general public, whichever occurs first.

Stockholder Action; Special Meetings. Our certificate of incorporation provides that stockholder action may not be taken by written action in lieu of a meeting and provides special meetings of the stockholders may only be called by our president or by our Board. These provisions could have the effect of delaying until the next stockholders' meeting stockholder actions that are favored by the holders of a majority of our outstanding voting securities. These provisions may also discourage another person or entity from making a tender offer for our common stock, because that person or entity, even if it acquired a majority of our outstanding voting securities, would be able to take action as a stockholder only at a duly called stockholders' meeting, and not by written consent. Our certificate of incorporation requires the affirmative vote of the holders of at least 75% of our shares of capital stock issued and outstanding and entitled to vote to amend or repeal the provisions relating to prohibition on action by written consent and the calling of a special meeting of stockholders.

Nominations. Our by-laws provide that nominations for election of directors may be made only by (i) the Board or a committee appointed by the Board; or (ii) a stockholder entitled to vote on director election, if the stockholder provides notice to the Secretary of the Corporation presented not less than 90 days nor more than 120 days prior to the anniversary of the last annual meeting (subject to the limited exceptions set forth in the by-laws). These provisions may deter takeovers by requiring that any stockholder wishing to conduct a proxy contest have its position solidified well in advance of the meeting at which directors are to be elected and by providing the incumbent Board with sufficient notice to allow them to put an election strategy in place.

Delaware Anti-Takeover Statute. We are subject to Section 203 of the DGCL, an anti-takeover statute. In general, Section 203 of the DGCL prohibits a publicly held Delaware corporation from engaging in a "business combination" with an "interested stockholder" for a period of three years following the time the person became an interested stockholder, unless the business combination or the acquisition of shares that resulted in a stockholder becoming an interested stockholder is approved in a prescribed manner. Generally, a "business combination" includes a merger, asset or stock sale, or other transaction resulting in a financial benefit to the interested stockholder. Generally, an "interested stockholder" is a person who, together with affiliates and associates, owns (or within three years prior to the determination of interested stockholder status did own) 15% or more of a corporation's voting stock. The existence of this provision would be expected to have an anti-takeover effect with respect to transactions not approved in advance by our Board, including discouraging attempts that might result in a premium over the market price for the shares of common stock held by our stockholders

The above provisions may deter a hostile takeover or delay a change in control or management of us.

DESCRIPTION OF WARRANTS

The following description, together with the additional information we may include in any applicable prospectus supplements and free writing prospectuses, summarizes the material terms and provisions of the warrants that we may offer under this prospectus, which may consist of warrants to purchase common stock or preferred stock and may be issued in one or more series. Warrants may be offered independently or together with common stock or preferred stock offered by any prospectus supplement, and may be attached to or separate from those securities. While the terms we have summarized below will apply generally to any warrants that we may offer under this prospectus, we will describe the particular terms of any series of warrants that we may offer in more detail in the applicable prospectus supplement and any applicable free writing prospectus. The terms of any warrants offered under a prospectus supplement may differ from the terms described below. However, no prospectus supplement will fundamentally change the terms that are set forth in this prospectus or offer a security that is not registered and described in this prospectus at the time of its effectiveness.

We will issue the warrants under a warrant agreement that we will enter into with a warrant agent to be selected by us. The warrant agent will act solely as an agent of ours in connection with the warrants and will not act as an agent for the holders or beneficial owners of the warrants. We will file as exhibits to the registration statement of which this prospectus is a part the form of warrant agreement, including a form of warrant certificate that describes the terms of the particular series of warrants we are offering before the issuance of the related series of warrants. The following summaries of material provisions of the warrants and the warrant agreements are subject to, and qualified in their entirety by reference to, all the provisions of the warrant agreement and warrant certificate applicable to a particular series of warrants. We urge you to read the applicable prospectus supplement and any applicable free writing prospectus related to the particular series of warrants that we sell under this prospectus, as well as the complete warrant agreements and warrant certificates that contain the terms of the warrants.

The applicable prospectus supplement will specify the terms relating to a series of warrants, including:

- the offering price and aggregate number of warrants offered;
- if applicable, the designation and terms of the securities with which the warrants are issued and the number of warrants issued with each such security or each principal amount of such security;
- if applicable, the date on and after which the warrants and the related securities will be separately transferable;
- the number of shares of common stock or preferred stock, as the case may be, purchasable upon the exercise of one warrant and the price at which these shares may be purchased upon such exercise;
- the effect of any merger, consolidation, sale or other disposition of our business on the warrant agreements and the warrants;
- the terms of any rights to redeem or call the warrants;

- any provisions for changes to or adjustments in the exercise price or number of securities issuable upon exercise of the warrants;
- the dates on which the right to exercise the warrants will commence and expire;
- the manner in which the warrant agreements and warrants may be modified;
- United States federal income tax consequences of holding or exercising the warrants;
- the terms of the securities issuable upon exercise of the warrants; and
- any other specific terms, preferences, rights or limitations of or restrictions on the warrants.

Before exercising their warrants, holders of warrants to purchase common stock or preferred stock will not have any of the rights of holders of the securities purchasable upon such exercise, including the right to receive dividends, if any, or payments upon our liquidation, dissolution or winding up or to exercise voting rights, if any.

DESCRIPTION OF UNITS

The following description, together with the additional information we may include in any applicable prospectus supplements and free writing prospectuses, summarizes the material terms and provisions of the units that we may offer under this prospectus. While the terms we have summarized below will apply generally to any units that we may offer under this prospectus, we will describe the particular terms of any series of units in more detail in the applicable prospectus supplement. The terms of any units offered under a prospectus supplement may differ from the terms described below. However, no prospectus supplement will fundamentally change the terms that are set forth in this prospectus or offer a security that is not registered and described in this prospectus at the time of its effectiveness.

We will file as exhibits to the registration statement of which this prospectus is a part the form of unit agreement that describes the terms of the series of units we are offering, and any supplemental agreements, before the issuance of the related series of units. The following summaries of material terms and provisions of the units are subject to, and qualified in their entirety by reference to, all the provisions of the unit agreement and any supplemental agreements applicable to a particular series of units. We urge you to read the applicable prospectus supplements related to the particular series of units that we sell under this prospectus, as well as the complete unit agreement and any supplemental agreements that contain the terms of the units.

We may issue units comprised of one or more shares of common stock, shares of preferred stock and warrants in any combination. Each unit will be issued so that the holder of the unit is also the holder of each security included in the unit. Thus, the holder of a unit will have the rights and obligations of a holder of each included security. The unit agreement under which a unit is issued may provide that the securities included in the unit may not be held or transferred separately, at any time or at any time before a specified date.

We will describe in the applicable prospectus supplement the terms of the series of units, including:

- the designation and terms of the units and of the securities comprising the units, including whether and under what circumstances those securities may be held or transferred separately;
- any provisions of the governing unit agreement that differ from those described below; and
- any provisions for the issuance, payment, settlement, transfer or exchange of the units or of the securities comprising the units.

The provisions described in this section, as well as those described under “Description of Capital Stock” and “Description of Warrants” will apply to each unit and to any common stock, preferred stock or warrant included in each unit, respectively.

DESCRIPTION OF SUBSCRIPTION RIGHTS

The following description, together with the additional information we may include in any applicable prospectus supplements and free writing prospectuses, summarizes the material terms and provisions of the subscription rights that we may offer under this prospectus. While the terms we have summarized below will apply generally to any subscription rights that we may offer under this prospectus, we will describe the particular terms of any series of subscription rights in more detail in the applicable prospectus supplement. The terms of any subscription rights offered under a prospectus supplement may differ from the terms described below. However, no prospectus supplement will fundamentally change the terms that are set forth in this prospectus or offer a security that is not registered and described in this prospectus at the time of its effectiveness.

We will file as exhibits to the registration statement of which this prospectus is a part the form of subscription rights agreement that describes the terms of the series of subscription rights we are offering, and any supplemental agreements, before the issuance of the related series of subscription rights. The following summaries of material terms and provisions of the subscription rights are subject to, and qualified in their entirety by reference to, all the provisions of the subscription rights agreement and any supplemental agreements applicable to a particular series of subscription rights. We urge you to read the applicable prospectus supplements related to the particular series of subscription rights that we sell under this prospectus, as well as the complete subscription rights agreement and any supplemental agreements that contain the terms of the subscription rights.

We may issue subscription rights to purchase common stock, preferred stock or other securities described in this prospectus or any combination thereof. These subscription rights may be issued independently or together with any other security offered by us and may or may not be transferable by the holder receiving the subscription rights in such offering. In connection with any offering of subscription rights, we may enter into a standby arrangement with one or more underwriters or other investors pursuant to which the underwriters or other investors may be required to purchase any securities remaining unsubscribed for after such offering.

To the extent appropriate, the applicable prospectus supplement will describe the specific terms of the subscription rights to purchase shares of our securities offered thereby, including the following:

- the date of determining the holders entitled to the rights distribution;
- the price, if any, for the subscription rights;
- the exercise price payable for the common stock, preferred stock or other securities upon the exercise of the subscription right;
- the number of subscription rights issued to each holder
- the amount of common stock, preferred stock, or other securities that may be purchased per each subscription right;
- any provisions for adjustment of the amount of securities receivable upon exercise of the subscription rights or of the exercise price of the subscription rights;
- the extent to which the subscription rights are transferable;
- the date on which the right to exercise the subscription rights shall commence, and the date on which the subscription rights shall expire;
- the extent to which the subscription rights may include an over-subscription privilege with respect to unsubscribed securities;
- the material terms of any standby underwriting or purchase arrangement entered into by us in connection with the offering of subscription rights;
- any applicable federal income tax considerations; and
- any other terms of the subscription rights, including the terms, procedures and limitations relating to the transferability, exchange and exercise of the subscription rights.

PLAN OF DISTRIBUTION

We may sell the securities being offered hereby in one or more of the following ways from time to time:

- through agents to the public or to investors;
- to underwriters for resale to the public or to investors;
- in "at the market" offerings, within the meaning of Rule 415(a)(4) of the Securities Act, to or through a market maker or into an existing trading market on an exchange or otherwise;
- directly to investors; or
- through a combination of any of these methods of sale.

We will set forth in a prospectus supplement the terms of the particular offering of securities, including:

- the terms of the offering;
- the name or names of any agents or underwriters;
- the purchase price of the securities being offered and the proceeds we will receive from the sale;
- any over-allotment options under which underwriters may purchase additional securities from us;
- any agency fees or underwriting discounts and other items constituting agents' or underwriters' compensation;
- any initial public offering price;
- any discounts or concessions allowed or reallowed or paid to dealers; and
- any securities exchanges or markets on which such securities may be listed.

We may issue to the holders of our common stock on a pro rata basis for no consideration, subscription rights to purchase shares of our common stock or preferred stock. These subscription rights may or may not be transferable by stockholders. The applicable prospectus supplement will describe the specific terms of any offering of our common or preferred stock through the issuance of subscription rights, including the terms of the subscription rights offering, the terms, procedures and limitations relating to the exchange and exercise of the subscription rights and, if applicable, the material terms of any standby underwriting or purchase arrangement entered into by us in connection with the offering of common or preferred stock through the issuance of subscription rights.

Agents

We may designate agents who agree to use their reasonable efforts to solicit purchases of our securities for the period of their appointment or to sell our securities on a continuing basis.

Underwriters

If we use underwriters for a sale of securities, the underwriters will acquire the securities for their own account. The underwriters may resell the securities in one or more transactions, including negotiated transactions, at a fixed public offering price or at varying prices determined at the time of sale. The obligations of the underwriters to purchase the securities will be subject to the conditions set forth in the applicable underwriting agreement. The underwriters will be obligated to purchase all the securities of the series offered if they purchase any of the securities of that series. We may change from time to time any initial public offering price and any discounts or concessions the underwriters allow or reallow or pay to dealers. We may use underwriters with whom we have a material relationship. We will describe the nature of any such relationship in any prospectus supplement naming any such underwriter. Only underwriters we name in the prospectus supplement are underwriters of the securities offered by the prospectus supplement.

Direct Sales

We may also sell securities directly to one or more purchasers without using underwriters or agents. Underwriters, dealers and agents that participate in the distribution of the securities may be underwriters as defined in the Securities Act, and any discounts or commissions they receive from us and any profit on their resale of the securities may be treated as underwriting discounts and commissions under the Securities Act. We will identify in the applicable prospectus supplement any underwriters, dealers or agents and will describe their compensation. We may have agreements with the underwriters, dealers and agents to indemnify them against specified civil liabilities, including liabilities under the Securities Act. Underwriters, dealers and agents may engage in transactions with or perform services for us in the ordinary course of their businesses.

Delayed Delivery Contracts

If the prospectus supplement indicates, we may authorize agents, underwriters or dealers to solicit offers from certain types of institutions to purchase securities at the public offering price under delayed delivery contracts. These contracts would provide for payment and delivery on a specified date in the future. The contracts would be subject only to those conditions described in the prospectus supplement. The applicable prospectus supplement will describe the commission payable for solicitation of those contracts.

Market Making, Stabilization and Other Transactions

Unless the applicable prospectus supplement states otherwise, each series of offered securities will be a new issue and will have no established trading market. We may elect to list any series of offered securities on an exchange. Any underwriters that we use in the sale of offered securities may make a market in such securities, but may discontinue such market making at any time without notice. Therefore, we cannot assure you that the securities will have a liquid trading market.

Any underwriter may also engage in stabilizing transactions, syndicate covering transactions and penalty bids in accordance with Rule 104 under the Exchange Act. Stabilizing transactions involve bids to purchase the underlying security in the open market for the purpose of pegging, fixing or maintaining the price of the securities. Syndicate covering transactions involve purchases of the 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 a selling concession from a syndicate member when the securities originally sold by the syndicate member are purchased in a syndicate covering transaction to cover syndicate short positions. Stabilizing transactions, syndicate covering transactions and penalty bids may cause the price of the securities to be higher than it would be in the absence of the transactions. The underwriters may, if they commence these transactions, discontinue them at any time.

Passive Market Making

Any underwriters who are qualified market makers on the Nasdaq Capital Market may engage in passive market making transactions in the securities on the Nasdaq Capital Market in accordance with Rule 103 of Regulation M, during the business day prior to the pricing of the offering, before the commencement of offers or sales of the securities. Passive market makers must comply with applicable volume and price limitations and must be identified as passive market makers. In general, a passive market maker must display its bid at a price not in excess of the highest independent bid for such security. If all independent bids are lowered below the passive market maker’s bid, however, the passive market maker’s bid must then be lowered when certain purchase limits are exceeded.

Derivative Transactions and Hedging

We, the underwriters or other agents may engage in derivative transactions involving the securities. These derivatives may consist of short sale transactions and other hedging activities. The underwriters or agents may acquire a long or short position in the securities, hold or resell securities acquired and purchase options or futures on the securities and other derivative instruments with returns linked to or related to changes in the price of the securities. In order to facilitate these derivative transactions, we may enter into security lending or repurchase agreements with the underwriters or agents. The underwriters or agents may effect the derivative transactions through sales of the securities to the public, including short sales, or by lending the securities in order to facilitate short sale transactions by others. The underwriters or agents may also use the securities purchased or borrowed from us or others (or, in the case of derivatives, securities received from us in settlement of those derivatives) to directly or indirectly settle sales of the securities or close out any related open borrowings of the securities.

Electronic Auctions

We may also make sales through the Internet or through other electronic means. Since we may from time to time elect to offer securities directly to the public, with or without the involvement of agents, underwriters or dealers, utilizing the Internet or other forms of electronic bidding or ordering systems for the pricing and allocation of such securities, you will want to pay particular attention to the description of that system we will provide in a prospectus supplement.

Such electronic system may allow bidders to directly participate, through electronic access to an auction site, by submitting conditional offers to buy that are subject to acceptance by us, and which may directly affect the price or other terms and conditions at which such securities are sold. These bidding or ordering systems may present to each bidder, on a so-called “real-time” basis, relevant information to assist in making a bid, such as the clearing spread at which the offering would be sold, based on the bids submitted, and whether a bidder’s individual bids would be accepted, prorated or rejected.

Upon completion of such an electronic auction process, securities will be allocated based on prices bid, terms of bid or other factors. The final offering price at which securities would be sold and the allocation of securities among bidders would be based in whole or in part on the results of the Internet or other electronic bidding process or auction.

General Information

Agents, underwriters, and dealers may be entitled, under agreements entered into with us, to indemnification by us against certain liabilities, including liabilities under the Securities Act. Our agents, underwriters, and dealers, or their affiliates, may be customers of, engage in transactions with or perform services for us, in the ordinary course of business.

The maximum consideration or discount to be received by any Financial Industry Regulatory Authority, or FINRA, member or independent broker dealer may not exceed 8.0% of the aggregate amount of the securities offered pursuant to this prospectus and any applicable prospectus supplement.

LEGAL MATTERS

Michael Best & Friedrich LLP, Madison, Wisconsin will pass for us upon the validity of the securities being offered by this prospectus and applicable prospectus supplement, and counsel named in the applicable prospectus supplement will pass upon legal matters for any underwriters, dealers or agents.

EXPERTS

The audited financial statements incorporated by reference in this prospectus and elsewhere in the registration statement have been so incorporated by reference in reliance upon the report of Baker Tilly Virchow Krause, LLP, independent registered public accountants, upon the authority of said firm as experts in accounting and auditing.

WHERE YOU CAN FIND ADDITIONAL INFORMATION

We file annual, quarterly and current reports, proxy statements and other information with the SEC. We have also filed a registration statement on Form S-3, including exhibits, under the Securities Act with respect to the securities offered by this prospectus. This prospectus is part of the registration statement, but does not contain all of the information included in the registration statement or the exhibits. You may read and copy the registration statement and any other document that we file with the SEC at the SEC’s Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for further information on the Public Reference Room. Our SEC filings are also available to the public on the internet at a website maintained by the SEC located at http://www.sec.gov.

INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

We disclose important information to you by referring you to documents that we have previously filed with the SEC or documents that we will file with the SEC in the future. The information incorporated by reference is considered to be part of this prospectus, and information in documents that we file later with the SEC will automatically update and supersede information in this prospectus. We incorporate by reference the documents listed below into this prospectus, and any future filings made by us with the SEC under Section 13(a), 13(c), 14 or 15(d) of the Exchange Act until the termination of this offering, including all filings made after the date of the initial registration statement and prior to the effectiveness of the registration statement. We hereby incorporate by reference the following documents):

- our Annual Report on Form 10-K for the fiscal year ended December 31, 2018, filed with the SEC on February 26, 2019;
- our Quarterly Report on Form 10-Q for the quarterly period ended March 31, 2019, filed with the SEC on May 6, 2019;
- our Definitive Proxy Statement on Schedule 14A, filed with the SEC on April 29, 2019;
- our Current Report on Form 8-K, filed with the SEC on February 15, 2019;
- our Current Report on Form 8-K, filed with the SEC on March 8, 2019;
- our Current Report on Form 8-K, filed with the SEC on March 19, 2019;
- our Current Report on Form 8-K, filed with the SEC on April 19, 2019; and
- the description of our securities contained in our Registration Statement on Form 8-A filed on August 14, 2014, including any amendment or report filed for the purpose of updating such description.

You should rely only on the information contained in this prospectus, as updated and supplemented by any prospectus supplement, or that information to which this prospectus or any prospectus supplement has referred you by reference. We have not authorized anyone to provide you with any additional information.

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 prospectus to the extent that a statement contained herein modifies or supersedes such statement. Any statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this prospectus.

You may request and obtain a copy of any of the filings incorporated herein by reference, at no cost, by writing or telephoning us at the following address or phone number:

Cellectar Biosciences, Inc., 3301 Agriculture Drive, Madison, WI 53716, Attention: Chief Financial Officer (608) 441-8120.

CELLECTAR BIOSCIENCES, INC.

$50,000,000

Common Stock
Preferred Stock
Warrants
Units
Subscription Rights

PROSPECTUS

September 20, 2017

PROSPECTUS SUPPLEMENT

1,982,000 Shares of Common Stock,

Roth Capital Partners

The date of this prospectus supplement is May 17, 2019.