

CLEVELAND BIOLABS INC
Form 424B5
February 05, 2015
Table of Contents

Filed pursuant to Rule 424(b)(5)

Registration No. 333-192755

PROSPECTUS SUPPLEMENT

(To Prospectus Dated January 10, 2014)

Cleveland BioLabs, Inc.

572,205 Shares of Common Stock

Pre-funded Warrants to Purchase 594,688 Shares of Common Stock

Pursuant to this prospectus supplement and the accompanying prospectus, we are offering an aggregate 1,166,893 shares of our common stock, par value \$0.005 per share, consisting of 572,205 shares of common stock, and pre-funded warrants to purchase up to 594,688 shares of our common stock (Series B Pre-funded Warrants). In a concurrent private placement, we are selling to the purchasers of shares of our common stock and pre-funded warrants in this offering shares of our Series A Convertible Preferred Stock and a warrant to purchase one share of our common stock for each share of common stock purchased or pre-funded in this offering and each share of our common stock underlying the shares of Series A Convertible Preferred Stock purchased in the concurrent private placement (the Series A Warrants). The Series A Warrants, the shares of our common stock issuable upon the exercise of the Series A Warrants, the Series A Convertible Preferred Stock and the common stock underlying the shares of Series A Convertible Preferred Stock are not being registered under the Securities Act of 1933, as amended, or 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.

Our common stock trades on the NASDAQ Capital Market (NASDAQ) under the symbol CBLI. We have applied to list the shares being sold in this offering on the NASDAQ. There can be no assurances that the NASDAQ will grant the application. On February 3, 2015, the last reported sales price of our common stock on the NASDAQ was \$3.64 per share.

The aggregate market value of the voting and non-voting common equity held by non-affiliates on February 3, 2015 was approximately \$18.6 million, which amount is based on 2,467,616 shares of outstanding common stock held by non-affiliates and a per share price of \$7.53 which was the closing sale price of our common stock as quoted on the NASDAQ Capital Market on December 16, 2014, as adjusted to give effect to the 20-for-1 reverse split effected January 28, 2015. Pursuant to General Instruction I.B.6 of Form S-3, in no event will we sell securities in a public primary offering with a value exceeding more than one-third of our public float in any 12-month period so long as our

public float remains below \$75.0 million. 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 carefully and consider the Risk Factors referenced on page S-8 of this prospectus supplement and on page 4 of the accompanying prospectus and the risk factors described in other documents incorporated by reference herein.

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

We have retained Ladenburg Thalmann & Co. Inc. to act as our exclusive placement agent in connection with this offering. The placement agent has agreed to use its reasonable best efforts to sell the securities offered by this prospectus supplement. We have agreed to pay the placement agent the placement agent fees set forth in the table below, which assumes that we sell all of the securities we are offering.

	Per Share	Total
Public offering price	\$ 3.00	\$ 3,500,679
Placement agent fees (1)	\$ 0.24	\$ 280,054
Proceeds, before expenses, to us	\$ 2.76	\$ 3,220,625

(1) We have agreed to reimburse the placement agent, Ladenburg Thalmann & Co. Inc. for certain of their expenses as described under the Plan of Distribution on page S-19 of this prospectus supplement. Delivery of the shares and pre-funded warrants will take place on or about February 6, 2015, subject to the satisfaction of certain conditions.

LADENBURG THALMANN

The date of this prospectus supplement is February 4, 2015.

Table of Contents**TABLE OF CONTENTS**

	Page
Prospectus Supplement	
<u>About this Prospectus Supplement</u>	S-1
<u>Summary</u>	S-2
<u>Cautionary Note About Forward-Looking Statements</u>	S-6
<u>Risk Factors</u>	S-8
<u>Use of Proceeds</u>	S-13
<u>Price Range of Common Stock</u>	S-14
<u>Dividend Policy</u>	S-14
<u>Dilution</u>	S-15
<u>Description of the Securities</u>	S-17
<u>Private Placement Transaction</u>	S-18
<u>Plan of Distribution</u>	S-19
<u>Legal Matters</u>	S-20
<u>Experts</u>	S-20
<u>Where You Can Find More Information</u>	S-20
<u>Incorporation of Certain Documents by Reference</u>	S-21

	Page
<u>ABOUT THIS PROSPECTUS</u>	ii
<u>SUMMARY</u>	1
<u>RISK FACTORS</u>	4
<u>SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS</u>	4
<u>USE OF PROCEEDS</u>	4
<u>RATIO OF EARNINGS TO FIXED CHARGES</u>	5
<u>DILUTION</u>	5
<u>DESCRIPTION OF SECURITIES</u>	5
<u>DESCRIPTION OF COMMON STOCK</u>	6
<u>DESCRIPTION OF WARRANTS</u>	8
<u>LEGAL OWNERSHIP OF SECURITIES</u>	10
<u>PLAN OF DISTRIBUTION</u>	13
<u>LEGAL MATTERS</u>	16
<u>EXPERTS</u>	16
<u>WHERE YOU CAN FIND MORE INFORMATION</u>	16
<u>INCORPORATION OF CERTAIN DOCUMENTS BY REFERENCE</u>	16

You should rely only on the information incorporated by reference or provided in this prospectus supplement, the accompanying prospectus and any free writing prospectus that we have authorized for use in connection with this offering. Neither we nor the placement agent have authorized anyone to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it. You should assume that the information appearing in this prospectus supplement, the accompanying prospectus and the documents incorporated by reference herein and therein are accurate only as of their respective dates. Our business, financial condition, results of operations and prospects may have changed since those dates. Neither this prospectus supplement nor the accompanying prospectus shall constitute 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 anyone to whom it is unlawful to make such offer or solicitation. Neither the delivery of this prospectus supplement nor any distribution of securities pursuant to this prospectus supplement shall, under any circumstances, create any implication that there has been no change in the information set forth or incorporated by reference into this prospectus supplement or in our affairs since the date of this prospectus supplement.

Table of Contents

ABOUT THIS PROSPECTUS SUPPLEMENT

This prospectus supplement is part of a registration statement (No. 333-192755) that we filed with the Securities and Exchange Commission (the SEC) using a shelf registration process. Under the registration statement, we registered the offering by us of common stock and warrants for sale from time to time in one or more offerings. This prospectus supplement provides specific information about the offering by us of our common stock under the shelf registration statement. This document is in two parts. The first part is the prospectus supplement, which adds to and updates information contained in the accompanying prospectus. The second part, the prospectus, provides more general information, some of which may not apply to this offering. Generally, when we refer to this prospectus, we are referring to both parts of this document combined. 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, you should rely on the information in this prospectus supplement.

Before purchasing any securities, you should carefully read both this prospectus supplement and the accompanying prospectus, together with the documents incorporated by reference herein as described under the heading **Incorporation of Certain Information by Reference** and the additional information described under the heading, **Where You Can Find More Information** in this prospectus supplement, as well as any free writing prospectus prepared by or on behalf of us or to which we have referred you.

In this prospectus, unless otherwise stated or the context otherwise requires, the terms **Cleveland BioLabs** and **CBLI** refer to Cleveland BioLabs, Inc., but not its subsidiaries and the **Company**, **we**, **us** and **our** refer to Cleveland BioLabs, Inc. together with its subsidiaries, some of which are consolidated. Each of the trade names or service marks appearing or incorporated by reference in this prospectus supplement or the accompanying prospectus are the property of their respective owners.

This prospectus supplement and the accompanying prospectus, including the information incorporated by reference into this prospectus supplement and the accompanying prospectus, include trademarks, service marks and trade names owned by us or other companies. All trademarks, service marks and trade names included or incorporated by reference into this prospectus supplement and the accompanying prospectus, or any related free writing prospectus, are the property of their respective owners.

Table of Contents

SUMMARY

This summary highlights selected information about our company, this offering and information appearing elsewhere in this prospectus supplement, in the accompanying prospectus, in the documents we incorporate by reference and in any free writing prospectus that we have authorized for use in connection with this offering. This summary is not complete and does not contain all the information that you should consider before investing in our common stock and the accompanying warrants. You should read this entire prospectus supplement and the accompanying prospectus carefully, including the Risk Factors contained in this prospectus supplement, the accompanying prospectus and the financial documents and notes incorporated by reference in this prospectus supplement and the accompanying prospectus and any free writing prospectus that we have authorized for use in connection with this offering, before making an investment decision. This prospectus supplement may add to, update or change information in the accompanying prospectus.

The Company

We are an innovative biopharmaceutical company seeking to develop first-in-class pharmaceuticals designed to address diseases with significant unmet medical need. We combine our proven scientific expertise and our depth of knowledge about our products' mechanisms of action into a passion for developing drugs to save lives. Our programs are focused on the implementation of novel pharmacological approaches to control cell death. Our proprietary drug candidates act via unique mechanisms that are designed to kill cancer and protect healthy cells. We conduct business in the United States and the Russian Federation and have worldwide development and commercialization rights to all of our product candidates, subject to certain financial obligations to our current licensors. Our lead product candidates are entolimod, which we are developing as a radiation countermeasure and an oncology drug, and CBL0137, our lead oncology product candidate. We also have an additional clinical stage program and multiple innovative projects in different stages of preclinical drug development. Our primary product development programs and their respective development stages are illustrated below:

* *Lead product development program*

** *HSC means hematopoietic stem cell*

Entolimod, our most advanced product candidate, is a Toll-like receptor 5, or TLR5, agonist, which we are developing as a radiation countermeasure for prevention of death from Acute Radiation Syndrome, or ARS, and as an oncology drug. We believe that entolimod is the most efficacious radiation countermeasure currently in development. Following is a summary of the clinical development of entolimod to date and regulatory status:

Table of Contents

Entolimod is being developed under the U.S. Food & Drug Administration's, or FDA's, Animal Efficacy Rule, or the Animal Rule, for the indication of reducing the risk of death following exposure to potentially lethal irradiation occurring as a result of a radiation disaster. We anticipated that entolimod will be administered within 25 hours following radiation exposure. We have completed two dose escalation clinical studies designed to evaluate the safety, pharmacokinetics and pharmacodynamics in a total of 150 healthy volunteers. Administration of entolimod was not associated with irreversible harm at any of the doses evaluated in these two studies. We have completed a Good Laboratory Practices, or GLP, randomized, blinded, placebo-controlled, pivotal study designed to evaluate the dose-dependent effect of entolimod on survival and biomarker induction in 179 non-human primates exposed to 7.2 Gy total body irradiation when entolimod or placebo were administered at 25 hours after radiation exposure. We have completed a GLP, randomized, open-label, placebo-controlled, pivotal study designed to evaluate the dose-dependent effect of Entolimod on biomarker induction in 160 non-irradiated non-human primates. We met with the FDA in July 2014 to present our human dose-conversion and to discuss our intent to submit a pre-Emergency Use Application, or pre-EUA. The FDA confirmed that our existing efficacy and safety data and animal-to-human dose conversion are sufficient to proceed with a pre-EUA submission and agreed to accept a pre-EUA application for review. We are currently preparing the pre-EUA submission, which we anticipate filing in the first half of 2015. If the FDA authorizes the application, then Federal agencies will be free to procure entolimod to stockpile and distribute in the event of an emergency, i.e. prior to the drug being formally approved by FDA under a Biologic License Application, or BLA.

We received contracts and grants with the U.S. government totaling \$44.6 million for the development of our lead compound, entolimod, for biodefense application as a radiation countermeasure through December 31, 2014. In January 2015, we announced that we received notice that the proposal application to support further development of entolimod as a medical radiation countermeasure was recommended for funding subject to negotiations by the Department of Defense, or DoD, office of Congressionally Directed Medical Research Programs, or CDMRP. The subject proposal includes aims to conduct several pivotal animal studies required by the FDA for submission of a BLA. There is no guarantee that DoD will award us a contract based on this proposal, or if an award is made, that it will support the studies originally proposed. The award of a contract by DoD based on the referenced proposal is subject to completion of successful negotiations and availability of funds.

Additionally, we have completed enrollment in a Phase 1 open-label, dose-escalation trial of entolimod in patients with advanced cancer in the United States and have begun dosing in a small expansion study in the Russian Federation enrolling additional patients at the highest doses achieved in the U.S. study. Both studies include evaluation of immune cell response to administrations of entolimod.

CBL0137, our lead oncology product candidate, acts through a novel mechanism enabling this compound to simultaneously target several molecular pathways within cancer cells. We believe that CBL0137 has the potential to be a broadly-marketed cancer treatment that will address the unmet needs of treating multiple types of cancer that are resistant to current treatments. CBL0137 inhibits Nuclear Factor kappa-B, or NF-kB, Heat Shock Factor Protein-1, or HSF-1, and Hypoxia-inducible factor 1-alpha, or HIF1 alpha, transcription factors that are essential for viability of many types of tumors and activates tumor suppressor protein p53 by modulating intracellular localization and activity of chromatin remodeling complex Facilitates Chromatin Transcription, or FACT. CBL0137 has demonstrated reproducible anti-tumor effects in animal models of colon, breast, renal, pancreatic, head and neck and prostate cancers, melanoma, non-small cell lung cancer, glioblastoma, lymphoma, leukemia and neuroblastoma. We are currently enrolling two Phase 1 trials of CBL0137: (i) a multi-center, single agent, dose-escalation study in the Russian Federation evaluating oral administration of CBL0137 in subjects with advanced solid tumors that are resistant or refractory to standard of care treatment; and (ii) a multi-center, single agent dose-escalation study in the United States, evaluating intravenous administration of CBL0137 in patients with metastatic or unresectable advanced solid cancers and lymphomas. We are conducting parallel evaluation of oral and intravenous routes of administration and continuous low-dose versus interrupted high-dose schedules to reduce our developmental risk by fully

characterizing the clinical pharmacology of CBL0137.

In January 2015, we announced clinical progress with CBL0137. A formal interim analysis of the 19 patients enrolled in the first six cohorts of the ongoing oral administration study indicated that the study medication was well tolerated at all investigated dose levels. The observation of drug exposure in plasma documented high oral bioavailability (typically estimated to be $\geq 50\%$). To date, no dose-limiting toxicities have been observed with either oral or intravenous administration through the highest CBL0137 dose levels tested. Heavily pretreated patients with advanced cancers of the esophagus, colon, breast, cervix, and prostate have had stable disease for periods ranging from 4 to 6 months. Peripheral blood mononuclear cells (PBMC) from evaluable blood samples have shown pharmacodynamic effects consistent with the expected mechanism of action of CBL0137.

S-3

Table of Contents

Our Partners

In December 2009, we entered into a Participation Agreement with BioProcess Capital Partners, LLC, a Russian Federation venture capital fund, to create a joint venture, Incuron, LLC (Incuron), to develop our Curaxin line of anti-cancer product candidates including CBL0137, a new, proprietary molecule optimized to better target similar mechanisms of action in combating cancer. Incuron is our partially-owned subsidiary, with approximately 46.97% of its equity interests held by us as at December 31, 2015.

In September 2011, we entered into an Investment Agreement with Open Joint Stock Company Rusnano , or Rusnano, a multi-billion Russian Federation venture fund, governing the creation of Panacela, a joint venture company formed to develop five separate product candidates. Panacela is a partially-owned subsidiary, with 54.6% of its shares held by us as at September 30, 2014. Panacela is currently performing under a three-year contract, received in October 2013, valued at approximately 149 million rubles with the Ministry of Industry and Trade of the Russian Federation to support pre-clinical and clinical studies of its product candidate, Mobilan, a cancer vaccine that is expected to enter the clinic in the first half of 2015.

Additionally, we leverage close development relationships with Roswell Park Cancer Institute, Cleveland Clinic Foundation and Children s Cancer Institute Australia. Together, our team of legal entities, financial partners and other collaborators engage in the collective development efforts necessary to advance all of our product candidates towards marketing approval and commercialization.

Risk Factors

Our business is subject to substantial risk. Please carefully consider the Risk Factors on page S-8 of this prospectus supplement and on page 3 of the accompanying prospectus and other information included and incorporated by reference in this prospectus supplement and the accompanying prospectus, including the risk factors incorporated by reference from our filings with the Securities and Exchange Commission, or the SEC, for a discussion of the factors you should consider carefully before deciding to purchase these securities. Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also impair our business operations. You should be able to bear a complete loss of your investment.

Corporate Information

We were incorporated in Delaware on June 5, 2003. We conduct operations through several subsidiaries, including our wholly-owned subsidiary, BioLab 612, LLC, and our partially-owned subsidiaries, Incuron, LLC and Panacela Labs, Inc.

Our principal executive offices are located at 73 High Street, Buffalo, New York 14203. Our telephone number is (716) 849-6810. Our website address is www.cbiolabs.com. We have included our website address as an inactive textual reference only. The information contained on, or that can be accessed through, our website is not a part of this prospectus.

Table of Contents**The Offering**

*The following summary contains basic information about our common stock and the offering and is not intended to be complete. It does not contain all the information that may be important to you. For a more complete understanding of our common stock, you should read the section of the accompanying prospectus entitled *Description of Common Stock*.*

Issuer	Cleveland BioLabs, Inc.
Common stock offered by us	572,205 shares
Common Stock outstanding after this offering⁽¹⁾	3,434,674 shares of common stock
Series B Pre-funded Warrants	We are offering Series B Pre-funded Warrants to purchase up to 594,688 shares of our common stock. Each Series B Pre-funded Warrant is exercisable upon issuance, subject to certain limitations. This prospectus supplement also relates to the offering of the shares of common stock issuable upon exercise of the Series B Pre-funded Warrants. There is currently no market for the Series B Pre-funded Warrants and none is expected to develop after this offering.
Use of proceeds	We estimate that the net proceeds from this offering, after deducting placement agent fees and expenses payable by us, will be approximately \$3.0 million. We intend to use the net proceeds from this offering for general corporate purposes, including, but not limited to, the funding of the continued development of our existing drug portfolio and general working capital. See <i>Use of Proceeds</i> .
Risk factors	Your investment in our securities involves substantial risks. You should consider the <i>Risk Factors</i> included and incorporated by reference in this prospectus supplement and the accompanying prospectus, including the risk factors incorporated by reference from our filings with the SEC.
Trading Market	Our common stock is listed on the Nasdaq Capital Market under the symbol CBLI.
Concurrent Private Placement	In a concurrent private placement, we are selling to the purchasers of shares of our common stock and pre-funded warrants in this offering shares of our Series A Convertible Preferred Stock convertible into 239,135 shares of our common stock, and a warrant to purchase one share of our common stock for each share of common stock purchased or pre-funded in this offering and each share of common stock underlying the shares of Series A Convertible Preferred Stock purchased in the concurrent private placement, or 1,406,028 warrants. We expect the gross proceeds from the concurrent private placement transaction to be approximately \$717,400. The warrants will be exercisable on the six month anniversary of the date of issuance at an exercise price of \$3.64 per share and will expire on the sixth anniversary of the date that the warrants become exercisable. The number of shares of Series A Convertible Preferred Stock designated is 718. The warrants, the shares of our common stock issuable upon the exercise of the warrants, the Series A Convertible Preferred Stock and the common stock

underlying the shares of Series A Convertible Preferred Stock 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. See Private Placement Transaction.

Transfer Agent and Warrant Agent

Continental Stock Transfer & Trust Company

S-5

Table of Contents

(1) Assumes no exercise of the Series A Warrants being offered in the concurrent private placement, no exercise of the Series B Pre-funded Warrants and no conversion of the Series A Convertible Preferred Stock.

Unless otherwise stated, all information in this prospectus supplement is based on 2,862,469 shares of common stock outstanding as of January 30, 2015, and does not include the following:

261,389 shares of common stock issuable upon exercise of outstanding options at a weighted-average exercise price of \$67.84 per share.

875,304 shares of common stock issuable upon exercise of outstanding warrants at a weighted-average exercise price of \$33.72 per share, with expirations as follows:

Expiration Date	Current Exercise Price	Number of Warrants
6/17/2015	\$ 100.000	8,809
7/16/2015	24.400	45,291
6/22/2016	100.000	73,414
2/25/2017	10.100	46,771*
10/24/2017	60.000	215,638
3/30/2018	10.100	174,307
9/29/2018	10.100	7,813*
1/16/2019	24.400	45,291
6/20/2019	11.200	155,510*
1/16/2021	20.400	102,460
		875,304

* - can be exercised cashlessly

A warrant issued to Rusnano in September 2013 to purchase that number of shares of the Company's common stock, equal to 69.2% of any outstanding amount remaining unpaid under a convertible loan between Panacela and Rusnano, at an exercise price of \$33.88 per share, and is only exercisable upon the occurrence of an uncured Event of Default under the convertible loan agreement. At September 30, 2014, the total amount owed under this loan was \$1,811,308, 69.2% of which is \$1,253,425 assignable under the warrant. Based on the exercise price of \$33.88, if the loan had been in default on September 30, 2014 and the warrant exercised, 36,997 shares would have been issuable in exchange for the assignment of Rusnano's receivable of \$1,253,425 to CBLI.

1,406,028 shares of common stock issuable upon the exercise of the Series A Warrants to be issued in the concurrent private placement. See Private Placement Transaction.

594,688 shares of common stock issuable upon the exercise of the Series B Pre-funded Warrants.

239,135 shares of common stock issuable upon conversion of certain Series A Convertible Preferred Stock to be issued in the concurrent private placement. See Private Placement Transaction.

The shares of common stock issuable upon the exercise of certain outstanding warrants, those that expire on February 25, 2017 and March 30, 2018 listed in the table above, contain full-ratchet anti-dilution protection provisions upon the issuance of shares of our common stock at a price less than the applicable exercise price. If such a lower-priced issuance occurs, the exercise price of these warrants will be reduced to the price at which our common stock is issued or deemed to be issued. Upon completion of the offering contemplated hereby, these warrant exercise prices will be adjusted down from the amounts listed above to \$3.00.

CAUTIONARY NOTE ABOUT FORWARD-LOOKING STATEMENTS

This prospectus, the accompanying prospectus, the documents incorporated by reference herein contain forward-looking statements within the meaning of Section 27A of the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act, that involve substantial risks and uncertainties.

Table of Contents

All statements, other than statements of historical fact, including statements regarding our strategy, future operations, future financial position, future revenues, projected costs, prospects, plans and objectives of management, are forward-looking statements. The words anticipate, believe, continue, should, estimate, expect, intend, project, will, and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words.

We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements, and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements we make. We have included important factors in the cautionary statements included and incorporated by reference in this prospectus that we believe could cause actual results or events to differ materially from the forward-looking statements that we make. See the section entitled Risk Factors herein for more information. You should consider these factors and other cautionary statements made in this prospectus and in the documents we incorporate by reference as being applicable to all related forward-looking statements wherever they appear in the prospectus and in the documents incorporated by reference. Unless specifically indicated, our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures or investments we may make. We do not assume any obligation to update any forward-looking statements.

S-7

Table of Contents

RISK FACTORS

Before purchasing our common stock and the accompanying warrants, you should carefully consider the risk factors set forth below and under the heading Risk Factors included in our most recent Annual Report on Form 10-K, as revised or supplemented by our subsequent Quarterly Reports on Form 10-Q, each of which are on file with the SEC and are incorporated herein by reference, as well as all other information contained in this prospectus supplement and the accompanying prospectus and incorporated by reference and any free writing prospectus that we have authorized for use in connection with this offering. The risks and uncertainties described below and in our most recent Annual Report on Form 10-K, as revised or supplemented by our subsequent Quarterly Reports on Form 10-Q, are not the only risks and uncertainties we face. Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also impair our business operations. If any of the risks described below or in our most recent Annual Report on Form 10-K, as revised or supplemented by our subsequent Quarterly Reports on Form 10-Q, actually occur, our business, financial condition and results of operations could suffer. As a result, the trading price of our stock could decline, perhaps significantly, and you could lose all or part of your investment. The risks discussed below and in most recent Annual Report on Form 10-K, as revised or supplemented by our subsequent Quarterly Reports on Form 10-Q, also include forward-looking statements and our actual results may differ substantially from those discussed in these forward-looking statements. See the section entitled Forward-Looking Information.

Risks Related To Our Financial Condition And Need For Additional Capital

We will require substantial additional financing in order to meet our business objectives.

Since our inception, most of our resources have been dedicated to the pre-clinical and clinical development of our product candidates. In particular, we are currently conducting multiple clinical trials of our product candidates, each of which will require substantial funds to complete. We believe that we will continue to expend substantial resources for the foreseeable future developing our pre-clinical and clinical product candidates. These expenditures will include costs associated with research and development, conducting pre-clinical and clinical studies, obtaining regulatory approvals and products from third-party manufacturers, as well as marketing and selling any products approved for sale. In addition, other unanticipated costs may arise. For example, if one of our subsidiaries faces insolvency, we may elect to make additional capital contributions to fund its operations and any such cash contributions will reduce cash available for our business. Because the outcome of our planned and anticipated clinical trials is highly uncertain, we cannot reasonably estimate the actual amounts of capital necessary to successfully complete the development and commercialization of our product candidates.

As of September 30, 2014, our cash, cash equivalents and short-term investments available to CBLI amounted to \$9.2 million. We believe that our existing cash, cash equivalents and marketable securities will allow us to fund our operating plan into the first quarter of 2015.

Because of the numerous risks and uncertainties associated with research, development and commercialization of pharmaceutical products, we are unable to estimate the exact amounts of our total capital requirements. Our future capital requirements depend on many factors, including:

the number and characteristics of the product candidates we pursue;

the scope, progress, results and costs of researching and developing our product candidates, and conducting pre-clinical and clinical studies;

the timing of, and the costs involved in, obtaining regulatory approvals for our product candidates;

the cost of commercialization activities for any of our product candidates that are approved for sale, including marketing, sales and distribution costs;

the cost of manufacturing our product candidates and any products we successfully commercialize;

our ability to establish and maintain strategic partnerships, licensing or other arrangements and the financial terms of such agreements;

the costs involved in preparing, filing, prosecuting, maintaining, defending and enforcing patent claims, including litigation costs and the outcome of such litigation;

Table of Contents

whether we realize the full amount of any projected cost savings associated with our strategic restructuring;

the occurrence of a breach or event of default under our loan agreement with Hercules Technology II, L.P., or Hercules, or under any other agreements with third parties;

the success of any pre-EUA submission we make with the FDA; and

the timing, receipt and amount of sales of, or royalties on, our future products, if any.

If our available cash and cash equivalents are insufficient to satisfy our liquidity requirements, or if we identify additional opportunities to do so, we may seek to sell additional equity or debt securities or obtain additional credit facilities. The sale of additional equity or convertible debt securities may result in additional dilution to our stockholders. If we raise additional funds through the issuance of debt securities or preferred stock or through additional credit facilities, these securities and/or the loans under credit facilities could provide for rights senior to those of our common stock and could contain covenants that would restrict our operations. Furthermore, any funds raised through collaboration and licensing arrangements with third parties may require us to relinquish valuable rights to our technologies or product candidates, or grant licenses on terms that are not favorable to us. In any such event, our business prospects, financial condition and results of operations could be materially adversely affected.

Even after taking into account the proceeds expected to be received from the sale of shares of our common stock offered pursuant to this prospectus supplement and the concurrent private placement of warrants, we may require additional capital beyond our currently forecasted amounts and additional funds may not be available when we need them, on terms that are acceptable to us, or at all. In particular, the decline in the market price of our common stock could make it more difficult for us to sell equity or equity-related securities in the future at a time and price that we deem appropriate. In addition, the variable rate clauses in the stock purchase agreement for the purchase of the common stock offered hereunder and the warrants to be offered in a concurrent private placement prohibit certain types of capital raising activities for certain periods of time and the pledge of assets in our loan and security agreement with Hercules, which may inhibit our ability to attract future investors and/or lenders. Additionally, our corporate structure, including the ownership of several of our product candidates in our non-wholly owned subsidiaries, may deter third parties from entering into collaboration and licensing arrangements with us. If we fail to raise sufficient additional financing, on terms and dates acceptable to us, we may not be able to continue our operations and the development of our product candidates, and may be required to reduce staff, reduce or eliminate research and development, slow the development of our product candidates, outsource or eliminate several business functions or shut down operations.

We have a history of operating losses. We expect to continue to incur losses and may not continue as a going concern.

We have incurred net losses of \$9.6 million and \$145.2 million for the nine months ended September 30, 2014 and since inception, respectively. We expect significant losses to continue for the next few years as we spend substantial sums on the continued research and development of our proprietary product candidates. There is no certainty that we will ever become profitable as a result of these expenditures. As a result of losses that will continue throughout our development stage, we may exhaust our financial resources and be unable to complete the development of our product candidates.

Our ability to become profitable depends primarily on the following factors:

our ability to obtain adequate sources of continued financing;

our ability to obtain approval for, and if approved, to successfully commercialize our product candidates;

our ability to successfully enter into license, development or other partnership agreements with third-parties for the development and/or commercialization of one or more of our product candidates;

our R&D efforts, including the timing and cost of clinical trials; and

our ability to enter into favorable alliances with third-parties who can provide substantial capabilities in clinical development, manufacturing, regulatory affairs, sales, marketing and distribution.

S-9

Table of Contents

Even if we successfully develop and market our product candidates, we may not generate sufficient or sustainable revenue to achieve or sustain profitability.

We may be unable to service our existing debt due to lack of cash flow, which could lead to default.

In September 2013, we entered into a loan and security agreement with Hercules under which we borrowed \$6.0 million. The current interest rate is 10.45%, with the initial 12 months of the facility requiring interest only payments and the following 30 months requiring interest and principal payments. The loan matures on January 1, 2017. Since entering into the agreement with Hercules and prior to a \$4.0 million principal payment in June 2014, we had been making monthly interest-only payments to Hercules of approximately \$54,000 per month. Commencing in November 2014, our payments increased to approximately \$76,000 per month to include amortization of principal, with a principal and interest payment of approximately \$205,000 due in January 2017. Additionally, upon termination of the loan, we will also owe Hercules an end-of-term fee of \$550,000. As of December 31, 2014, the remaining principal and end-of-term fee owed to Hercules amounted to \$2.4 million. We granted Hercules a first priority security interest in substantially all of our assets, with the exception of (i) our intellectual property, where the security interest is limited to proceeds of intellectual property, and (ii) following the June 2014 loan paydown of \$4.0 million, our equity interest in Incuron.

If we do not make the required payments when due, either at maturity, or at applicable installment payment dates, or if we breach the agreement, default under the agreement as a result of an occurrence of a material adverse event, as defined in the loan agreement, or become insolvent, Hercules could elect to declare all amounts outstanding together with all accrued and unpaid interest and penalties, to be immediately due and payable. In order to continue our planned operations and satisfy our debt obligations with Hercules, we will need to raise additional capital in the future. Additional capital may not be available on terms acceptable to us, or at all. Even if we were able to repay the full amount in cash, any such repayment could leave us with little or no working capital for our business. If we are unable to repay these amounts, Hercules will have a first claim on our assets pledged under the loan agreement. If Hercules should attempt to foreclose on the collateral, there may not be any assets remaining for distribution to shareholders after repayment in full of such secured indebtedness. Any default under the loan agreement and resulting foreclosure would have a material adverse effect on our financial condition and our ability to continue our operations.

Additionally, in September 2013, our partially owned subsidiary Panacela entered into a \$1.5 million Convertible Loan Agreement with Rusnano, or the Rusnano Loan, and is required to pay all unpaid principal and interest under the loan in September 2015. The loan may be converted into shares of Panacela stock at any time at Rusnano's option or will automatically convert upon certain financing events. In the event Panacela defaults on the loan and such default is not cured, Rusnano shall have the right to exercise a warrant to purchase shares of Cleveland BioLabs common stock equal to 69.2% of the outstanding amount remaining unpaid under the Rusnano Loan at the time of exercise, divided by the exercise price of \$33.88 per share.

Our ability to use our net operating loss carryforwards may be limited.

As of December 31, 2013, we had federal net operating loss carryforwards, or NOLs, of \$109.9 million to offset future taxable income, which begin to expire if not utilized by 2023. Under the provisions of the Internal Revenue Code, substantial changes in our ownership, in certain circumstances, will limit the amount of NOLs that can be utilized annually in the future to offset taxable income. In particular, section 382 of the Internal Revenue Code imposed limitations on a company's ability to use NOLs if a company experiences a more than 50% ownership change over a three-year period. If we are limited in our ability to use our NOLs in future years in which we have taxable income, we will pay more taxes than if we were able to utilize our NOLs fully. A full valuation allowance has been recorded against our deferred tax assets, including the net operating loss carryforwards, as we believe it is more likely than not

we will be unable to realize the benefit of these assets.

Risks Relating to our Securities and this Offering

There is uncertainty regarding the application of the federal and state securities laws to our offering of common stock and warrants, and there is a corresponding risk that we could be required to refund the purchase price of securities offered to purchasers who so elect.

S-10

Table of Contents

We are conducting an offering under a registration statement filed with the Securities and Exchange Commission and a concurrent private placement intended to comply with the requirements of Section 4(a)(2) under the Securities Act of 1933, as amended, and Rule 506(b) promulgated thereunder. See Private Placement Transaction. Shares of common stock and warrants are being offering and sold in combination. The shares of common stock and pre-funded warrants are intended to be offered and sold in a transaction registered under the Securities Act, while the other warrants and shares of common stock issuable thereunder are intended to be offered and sold in a private placement exempt from the registration requirements of the Securities Act.

While we are aware of other transactions using a concurrent public/private offering approach, the Commission has not addressed whether concurrent public and private offerings and sales to the same prospective investors would adversely impact the public offering or preclude the private offering from satisfying the requirements of Rule 506(b). If the securities offered in our concurrent private placement do not satisfy the conditions of Rule 506(b), the offering would be a violation of Section 5 of the Securities Act and each purchaser would have the right to rescind its purchase of the securities, meaning that we would be required to refund the purchase price of the securities to each purchaser electing rescission. If that were to occur, we would face severe financial demands and reputational harm that could adversely affect our business and operations. Additionally, if we did not in fact qualify for the exemptions upon which it has relied, we may become subject to significant fines and penalties imposed by the Commission. It is also possible that additional remedies may be available to purchasers under applicable state law.

If we are unable to obtain shareholder approval for the issuance of the all of the shares of common stock upon conversion of the Preferred Stock, exercise of the Series B Pre-funded Warrants or exercise of the Series A Warrants, we will owe dividend, redemption and other obligations on the Preferred Stock.

We agreed to seek approval from our stockholders as may be required by the applicable rules and regulations of the Nasdaq Stock Market, including the issuance of all of the shares of common stock upon conversion of the Preferred Stock and exercise of the Series B Pre-funded Warrants in excess of 19.99% of our issued and outstanding common stock on the closing date of the agreement, including certain adjustments to the conversion price of the Preferred Stock and exercise of the Series B Pre-funded Warrants. We refer to this approval as the Shareholder Approval. Each share of Preferred Stock will be convertible into Common Stock at any time at the election of the investor, subject to obtaining the Shareholder Approval for any amounts exceeding these thresholds. If we are unable to obtain the Shareholder Approval, we will be required to call a meeting every 65 days to continue seeking the Shareholder Approval until obtained or the Preferred Stock is no longer outstanding.

In addition, among other conditions, until we obtain Stockholder Approval, we will be required to continue complying with negative covenants that limit our ability to incur debt, incur liens, amend our charter documents, repurchase securities, pay dividends or enter into related party transactions, which could adversely impact our operations.

The price of our common stock has been and could remain volatile, which may in turn expose us to securities litigation.

The market price of our common stock has historically experienced and may continue to experience significant volatility. In 2014, the market price of our common stock, which is listed on the NASDAQ Capital Market, fluctuated from a high of \$24.80 per share in the first quarter of 2014 to a low of \$5.40 in the fourth quarter of 2014. On February 3, 2015 the closing price of our common stock was \$3.64. The listing of our common stock on the NASDAQ Capital Market does not assure that a meaningful, consistent and liquid trading market will exist, and in recent years, the market has experienced extreme price and volume fluctuations that have particularly affected the market prices of many smaller companies like us. Our common stock is thus subject to this volatility in addition to volatility caused by the occurrence of industry and company specific events. Factors that could cause fluctuations include, but are not

limited to, the following:

Our progress in developing and commercializing our products;

Price and volume fluctuations in the overall stock market from time to time;

Fluctuations in stock market prices and trading volumes of similar companies;

Actual or anticipated changes in our earnings or fluctuations in our operating results or in the expectations of securities analysts;

General economic conditions and trends;

Major catastrophic events;

Sales of large blocks of our stock;

Departures of key personnel;

Changes in the regulatory status of our product candidates, including results of our pre-clinical studies and clinical trials;

Status of contract and funding negotiations relating to our product candidates;

Events affecting our collaborators;

Announcements of new products or technologies, commercial relationships or other events by us or our competitors;

Regulatory developments in the U.S. and other countries;

Failure of our common stock to be listed or quoted on the NASDAQ Capital Market, other national market system or any national stock exchange;

Table of Contents

Changes in accounting principles; and

Discussion of us or our stock price by the financial and scientific press and in online investor communities.

As a result of the volatility of our stock price, we could be subject to securities litigation, which could result in substantial costs and divert management's attention and company resources from our business.

We have received a delisting notice from The NASDAQ Stock Market. Our common stock may be involuntarily delisted from trading on The NASDAQ Capital Market if we fail to regain compliance with the minimum closing bid price requirement of \$1.00 per share. A delisting of our common stock is likely to reduce the liquidity of our common stock and may inhibit or preclude our ability to raise additional financing.

The quantitative listing standards of the NASDAQ Stock Market, or NASDAQ, require, among other things, that listed companies maintain a minimum closing bid price of \$1.00 per share. We failed to satisfy this threshold for 30 consecutive trading days and on March 10, 2014, we received a letter from NASDAQ indicating that we have been provided an initial period of 180 calendar days, or until September 8, 2014, in which to regain compliance. On September 9, 2014 we received an additional 180-day compliance period that will end on March 9, 2015. If we do not regain compliance by March 9, 2015, the NASDAQ staff will provide written notice that our common stock is subject to delisting. To regain compliance with this listing requirement, we conducted a reverse split of our common stock. We received approval from our shareholders on January 27, 2015 to conduct a reverse stock split and we effected such split on January 28, 2015.

In addition to the minimum closing bid price requirement, we are required to comply with certain NASDAQ continued listing requirements, including a series of financial tests relating to shareholder equity, public float, and number of market makers and shareholders. If we fail to maintain compliance with any of those requirements, our common stock could be delisted from NASDAQ's Capital Market. If, for any reason, NASDAQ should delist our common stock from trading on its exchange and we are unable to obtain listing on another national securities exchange or take action to restore our compliance with the NASDAQ continued listing requirements, a reduction in some or all of the following may occur, each of which could have a material adverse effect on our shareholders:

the liquidity of our common stock;

the market price of our common stock;

our ability to obtain financing for the continuation of our operations;

the number of institutional and general investors that will consider investing in our common stock;

the number of investors in general that will consider investing in our common stock;

the number of market makers in our common stock;

the availability of information concerning the trading prices and volume of our common stock; and

the number of broker-dealers willing to execute trades in shares of our common stock.

If securities or industry analysts do not publish research or reports about our business, or publish negative reports about our business, our stock price and trading volume could decline.

The trading market for our common stock depends in part on the research and reports that securities or industry analysts publish about us or our business. We do not have any control over these reports and we currently do not have any industry analysts covering us. In the event we do regain analyst coverage, there can be no assurance that analysts will provide favorable coverage. Our stock price may be adversely impacted by our current lack of analyst coverage as we may have less visibility in the financial markets than other companies in our industry, which may cause declined trading volume and stock price.

Purchasers in this offering will experience immediate and substantial dilution in the book value of their investment.

Table of Contents

The public offering price of the shares offered by this prospectus will be substantially higher than the as adjusted net tangible book value per share of our common stock based on the total value of our tangible assets less our total liabilities immediately following this offering. Therefore, if you purchase shares of our common stock in this offering, you will experience immediate and substantial dilution of approximately \$0.55 per share in the price you pay for shares of our common stock as compared to the as adjusted net tangible book value per share, based on the offering price of \$3.00 per share. In addition, we have a significant number of options and warrants outstanding. To the extent outstanding options or warrants to purchase shares of common stock are exercised, there will be further dilution. For further information on this calculation, see [Dilution](#) elsewhere in this prospectus.

We have broad discretion in the use of net proceeds from this offering and may not use them effectively.

Our management will have broad discretion in the application of the net proceeds from this offering, including for any of the purposes described in the section entitled [Use of Proceeds](#), and you will not have the opportunity as part of your investment decision to assess whether the net proceeds are being used appropriately. Because of the number and variability of factors that will determine our use of the net proceeds from this offering, their ultimate use may vary substantially from their intended use. The failure by our management to apply these funds effectively could harm our business. Pending their use, we may invest the net proceeds from this offering in short-term, investment-grade, interest-bearing securities. These investments may not yield a favorable return to our stockholders.

USE OF PROCEEDS

We estimate the net proceeds from this offering will be approximately \$3,020,625, after deducting placement agent fees and our estimated offering expenses.

We currently intend to use the net proceeds from this offering for working capital and general corporate purposes, including research and development, clinical trials and general and administrative expenses. As a result, our management will retain broad discretion in the allocation and use of the net proceeds of this offering, and investors will be relying on the judgment of our management with regard to the use of these net proceeds. Pending application of the net proceeds for the purposes as described above, we expect to invest the net proceeds in short-term, interest-bearing securities, investment grade securities, certificates of deposit or direct or guaranteed obligations of the U.S. government.

Table of Contents**PRICE RANGE OF COMMON STOCK**

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

The following table sets forth, for the periods indicated, the high and low closing prices of our common stock, as reported on the Nasdaq Capital Market. We effected a 20-for-1 reverse share split with respect to our ordinary shares, options and warrants on January 28, 2015. Reported prices in the table below have been adjusted to give retroactive effect to the share split.

Calendar Quarter	High	Low
2015		
First quarter (through February 3, 2015)	\$ 6.20	\$ 3.64
2014		
First quarter	\$ 24.80	\$ 12.80
Second quarter	\$ 15.60	\$ 9.20
Third quarter	\$ 11.60	\$ 7.60
Fourth quarter	\$ 10.20	\$ 5.40
2013		
First quarter	\$ 45.60	\$ 26.00
Second quarter	\$ 45.20	\$ 28.60
Third quarter	\$ 36.80	\$ 29.20
Fourth quarter	\$ 33.60	\$ 19.40

On February 3, 2015, the last reported sale price of our common stock on the Nasdaq Capital Market was \$3.64 per share.

DIVIDEND POLICY

We have never declared or paid any cash dividends on our common stock. We intend to retain any future earnings to finance the growth and development of our business and do not anticipate paying any cash dividends in the foreseeable future. Any dividends paid will be solely at the discretion of our board of directors.

Table of Contents**DILUTION**

If you invest in our common stock, your ownership interest will be diluted to the extent of the difference between the public offering price per share and the pro forma as-adjusted net tangible book value per share after this offering.

Our net tangible book value as of September 30, 2014 was \$3.3 million, or \$1.16 per share of common stock. We calculate net tangible book value per share by dividing the net tangible book value, which is tangible assets less total liabilities, by the number of outstanding shares of our common stock as of September 30, 2014.

Our pro forma net tangible book value as of September 30, 2014 was \$5.4 million, or \$1.88 per share of common stock. Pro forma net tangible book value per share represents total tangible assets less total liabilities, divided by the number of shares of our common stock outstanding as of September 30, 2014, after giving effect to the deconsolidation of Incuron as a result of the Company becoming a minority owner of Incuron due to a disposition of 3.05% of our participations interests in Incuron to BioProcess Capital Partners LLC on November 25, 2014.

After giving further effect to the sale of 572,205 shares of our common stock in this offering and the pre-funding of warrants to purchase 594,688 shares of our common stock, both at an offering price of \$3.00 per share (attributing no value to the warrants or Preferred Stock being offered in the concurrent private placement), and after deducting estimated offering commissions and expenses payable by us, our pro forma as adjusted net tangible book value as of September 30, 2014 would have been \$8.4 million, or \$2.446 per share of common stock. This represents an immediate increase in the net tangible book value of \$0.57 per share to our existing stockholders and an immediate and substantial dilution in net tangible book value of \$0.55 per share to new investors. The following table illustrates this per share dilution:

Assumed offering price per share	\$ 3.00
Net tangible book value per share as September 30, 2014	\$ 1.16
Estimated increase in net tangible book value per share after the deconsolidation of Incuron, based on assumptions set forth in our Form 8-K filed on December 2, 2014	\$ 0.72
Pro forma net tangible book value per share as of September 30, 2014	\$ 1.88
Increase in net tangible book value per share after this offering	\$ 0.57
Pro forma as-Adjusted net tangible book value per share as of September 30, 2014, after giving effect to this offering	\$ 2.45
Dilution per share to new investors in this offering	\$ 0.55

The above discussion and table are based on 2,855,510 shares of our common stock outstanding as of September 30, 2014 and does not include:

290,133 shares issuable upon the exercise of outstanding stock options with a weighted-average exercise price of \$70.44 per share;

72,551 shares of common stock not subject to stock awards and reserved for issuance under our equity incentive plans;

115,000 shares of common stock not subject to stock awards and reserved for issuance under our Employee Stock Purchase Plan;

S-15

Table of Contents

shares of common stock issuable upon the exercise of our outstanding warrants, of which there were warrants outstanding as of September 30, 2013, to purchase 875,304 shares of common stock at an exercise price of \$33.72 per share, including: 228,891 shares of common stock at an exercise price of \$10.10 per share, 215,638 shares of common stock at an exercise price of \$60.00 per share, 155,510 shares of common stock at an exercise price of \$11.20 per share, 102,460 shares of common stock at an exercise price of \$20.40 per share, 90,582 shares of common stock at an exercise price of \$24.40 per share, and 82,223 shares of common stock at an exercise price of \$100.00 per share.

36,997 shares of common stock issuable at a rate of \$33.88 per share upon an event of default under the convertible loan agreement between Panacela and Rusnano; and

1,406,028 shares of common stock issuable upon the exercise of certain Series A Warrants to be issued in connection with the concurrent private placement described below under Private Placement Transaction.

594,688 shares of common stock issuable upon the exercise of the Series B Pre-funded Warrants.

239,135 shares of common stock issuable upon the conversion of certain Series A Convertible Preferred Stock to be issued in connection with the concurrent private placement described below under Private Placement Transaction.

Because there is no minimum offering amount required as a condition to the closing of this offering, the dilution per share to new investors may be more than that indicated above in the event that the actual number of shares sold, if any, is less than the maximum number of shares of our common stock we are offering.

The above illustration of dilution per share to investors participating in this offering assumes no exercise of outstanding options to purchase our common stock or outstanding warrants to purchase shares of our common stock. The exercise of outstanding options and warrants having an exercise price less than the offering price will increase dilution to new investors. The shares of common stock issuable upon the exercise of our outstanding warrants and the exercise price in respect thereof are subject to adjustment in certain circumstances. The shares of common stock issuable upon the exercise of certain outstanding warrants contain full-ratchet anti-dilution protection provisions upon the issuance of shares of our common stock at a price less than the applicable exercise price. If such a lower-priced issuance occurs, the exercise price of these warrants will be reduced to the price at which our common stock is issued or deemed to be issued.

Table of Contents

DESCRIPTION OF SECURITIES

In this offering, we are offering an aggregate 1,166,893 shares of our common stock, par value \$0.005 per share, consisting of consisting of 572,205 shares of common stock, and pre-funded warrants to purchase up to 594,688 shares of our common stock (Series B Pre-funded Warrants). The material terms and provisions of our common stock are described under the caption Description of Common Stock starting on page 6 of the accompanying prospectus.

Description of Series B Pre-funded Warrants. The following is a brief summary of certain terms and conditions of the pre-funded warrants being offered by this prospectus supplement. The following description is subject in all respects to the provisions contained in the pre-funded warrants.

Form. The pre-funded warrants will be issued as individual warrant agreements to the investors. You should review the form of pre-funded warrant, which is filed as an exhibit to our Current Report on Form 8-K that we expect to file with the Securities and Exchange Commission, or SEC, on February 6, 2015 and that has been incorporated into this prospectus supplement by reference, for a complete description of the terms and conditions applicable to the pre-funded warrants.

Exercisability. The pre-funded warrants are exercisable at any time after their original issuance. The pre-funded warrants will be exercisable, at the option of each holder, in whole or in part by delivering to us a duly executed exercise notice. No fractional shares of common stock will be issued in connection with the exercise of a pre-funded warrant. The number of shares of common stock underlying the pre-funded warrants are subject to adjustment due to stock dividends, splits, as well as subsequent dilutive issuances.

Exercise Limitations. A holder will not have the right to exercise any portion of the pre-funded warrant if the holder (together with its affiliates) would beneficially own in excess of 9.99% of the number of shares of our common stock outstanding immediately after giving effect to the exercise, as such percentage ownership is determined in accordance with the terms of the pre-funded warrants. However, any holder may increase or decrease such percentage to any other percentage, but in no event above 9.99%, provided that any increase of such percentage will not be effective until 61 days after notice of such increase from the holder to us.

Transferability. Subject to applicable laws, the pre-funded warrants may be offered for sale, sold, transferred or assigned without our consent.

Exchange Listing. We do not plan on applying to list the pre-funded warrants on the Nasdaq Capital Market, any other national securities exchange or any other nationally recognized trading system.

Fundamental Transactions. In the event of a fundamental transaction, as described in the pre-funded warrants and generally including any reorganization, recapitalization or reclassification of our common stock, the sale, transfer or other disposition of all or substantially all of our properties or assets, our consolidation or merger with or into another person, the acquisition of more than 50% of our outstanding common stock, or any person or group becoming the beneficial owner of 50% of the voting power represented by our outstanding common stock, the holders of the pre-funded warrants will be entitled to receive upon exercise of the pre-funded warrants the kind and amount of securities, cash or other property that the holders would have received had they exercised the pre-funded warrants immediately prior to such fundamental transaction.

Rights as a Stockholder. Except by virtue of such holder's ownership of shares of our common stock, the holder of a pre-funded warrant does not have the rights or privileges of a holder of our common stock, including any voting rights, until the holder exercises the pre-funded warrant.

S-17

Table of Contents

PRIVATE PLACEMENT TRANSACTION

In a concurrent private placement (the Private Placement Transaction), we are selling to purchasers of our common stock and pre-funded warrants in this offering shares of our Series A Convertible Preferred Stock (the Preferred Stock) and a warrant (collectively, the Series A Warrants) to purchase one share of our common stock for each share of common stock purchased or pre-funded in this offering and each share of common stock underlying the shares of Series A Convertible Preferred Stock purchased in the Private Placement Transaction. We expect the gross proceeds from this Private Placement Transaction to be approximately \$717,400.

The Series A Warrants, the Preferred Stock, the shares of our common stock issuable upon the exercise of the Series A Warrants and the common stock underlying the shares of Preferred Stock 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 of Preferred Stock and shares of common stock issued upon exercise of the Series A Warrants or upon conversion of the Preferred Stock 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.

We will be required to file a registration statement on Form S-3 within 30 calendar days of the issuance of the Series A Warrants to provide for the resale of the shares of common stock issuable upon the exercise of the Series A Warrants and will be obligated to use our best efforts to keep such registration statement effective during the term of the Series A Warrants, and our commercially reasonable efforts to keep such registration statement effective until the earlier of (i) the date on which the shares of common stock issuable upon the exercise of the Series A Warrants and upon the conversion of the Preferred Stock may be sold without registration or (ii) the date on which all of the shares of common stock issuable upon the exercise of the Series A Warrants and upon the conversion of the Preferred Stock have been sold under the registration statement or pursuant to Rule 144 under the Securities Act of 1933, as amended, or any other rule of similar effect.

Description of Series A Warrants. Each Series A Warrant will be exercisable on the six month anniversary of the date of its issuance (the Initial Exercise Date) at an exercise price of \$3.64 per share, subject to adjustment, and will remain exercisable for six years from the date it becomes exercisable, but not thereafter. Subject to limited exceptions, a holder of Series A 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 9.99% of the number of shares of our common stock outstanding immediately after giving effect to such exercise (the Beneficial Ownership Limitation); provided, however, that upon 61 days prior notice to the Company, 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.

The exercise price and number of the shares of our common stock issuable upon the exercise of the Series A Warrants issuable upon exercise of the Series A 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 A Warrants.

The Series A Warrants will be exercisable on a cashless basis in certain circumstances. In addition, in the event of a fundamental transaction that is (i) an all cash or substantially all cash transaction, (ii) a Rule 13e-3 transaction as defined in Rule 13e-3 under the Securities Exchange Act of 1934, as amended, or (iii) with certain limited exceptions, a fundamental transaction involving a person or entity not traded on a national securities exchange, including, but not limited to, the Nasdaq Global Select Market, the Nasdaq Global Market, or the Nasdaq Capital Market, then the

Company 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 A Warrant as determined in accordance with the Black Scholes option pricing model.

Description of Preferred Stock. The number of shares of Preferred Stock designated is 718 and each share of Preferred Stock has a stated value equal to \$1,000. Capitalized terms not defined herein have the meanings assigned to them in the Certificate of Designations of Preferences, Rights and Limitations of Series A Convertible Preferred Stock.

Voting Rights. Except as otherwise provided therein or as otherwise required by law, the Preferred Stock shall have no voting rights. However, as long as any shares of Preferred Stock are outstanding, the Company shall not, without the affirmative vote of the Holders of a majority of the then outstanding shares of the Preferred Stock, (a) alter or change adversely the powers, preferences or rights given to the Preferred Stock or alter or amend this Certificate of Designation, (b) authorize or create any class of stock ranking as to dividends, redemption or distribution of assets upon a Liquidation (as defined herein) senior to, or otherwise pari passu with, the Preferred Stock, (c) amend its certificate of incorporation or other charter documents in any manner that adversely affects any rights of the Holders, (d) increase the number of authorized shares of Preferred Stock, or (e) enter into any agreement with respect to any of the foregoing.

Liquidation. Upon any liquidation, dissolution or winding-up of the Company, whether voluntary or involuntary (a Liquidation), the Holders shall be entitled to receive out of the assets, whether capital or surplus, of the Company an amount equal to the Stated Value, plus any other fees, liquidated damages or dividends then due and owing thereon under this Certificate of Designation, for each share of Preferred Stock before any distribution or payment shall be made to the holders of any Junior Securities, and if the assets of the Company shall be insufficient to pay in full such amounts, then the entire assets to be distributed to the Holders shall be ratably distributed among the Holders in accordance with the respective amounts that would be payable on such shares if all amounts payable thereon were paid in full. A Fundamental Transaction or Change of Control Transaction shall not be deemed a Liquidation. The Company shall mail written notice of any such Liquidation, not less than 45 days prior to the payment date stated therein, to each Holder.

Conversion Price. The conversion price for the Preferred Stock shall equal \$3.00, subject to adjustment therein.

In addition, until the date that (i) Shareholder Approval has been obtained and deemed effective, (ii) the Series B Prefunded Warrants are no longer outstanding, and (iii) there is an effective registration statement registering the resale of all of the Conversion Shares underlying the Preferred Stock, we will be required to continue complying with negative covenants that limit our ability to incur debt, incur liens, amend our charter documents, repurchase securities, pay dividends or enter into related party transactions, which could adversely impact our operations.

Table of Contents**PLAN OF DISTRIBUTION**

Pursuant to a placement agency agreement, dated as of February 4, 2015, between us and Ladenburg Thalmann & Co. Inc., we engaged Ladenburg Thalmann & Co. Inc. as our exclusive placement agent to solicit offers to purchase the securities offered by this prospectus supplement. Ladenburg Thalmann & Co. Inc. is not purchasing any common stock for its own account in this offering, and is not required to arrange the purchase or sale of any additional specific number or dollar amount of the securities.

Ladenburg Thalmann & Co. Inc. has agreed to use its reasonable best efforts to arrange for the sale of all of the securities in this offering. There is no requirement that any minimum number of common stock or dollar amount of common stock be sold in this offering and there can be no assurance that we will sell all or any of the common stock being offered. We will enter into securities purchase agreements directly with the investors who purchase securities in this offering. The engagement letter provides that the obligations of Ladenburg Thalmann & Co. Inc. and the investors are subject to certain conditions precedent, including, among other things, the absence of any material adverse change in our business and the receipt of certain opinions, letters and certificates from us or our counsel.

We currently anticipate that the closing of this offering will occur on or about February 6, 2015, subject to customary closing conditions. On the closing date, the following will occur:

we will receive funds in the amount of the aggregate purchase price;

Ladenburg Thalmann & Co. Inc., as placement agent, will receive the placement agent fees in accordance with the terms of the placement agency agreement; and

we will deliver the securities to the investors.

We have agreed to pay Ladenburg Thalmann & Co. Inc. an aggregate fee equal to 8% on aggregate gross proceeds in this offering. We have also agreed to reimburse Ladenburg Thalmann & Co. Inc. for expenses incurred by it in connection with this offering. Such reimbursement will be limited to a maximum of \$100,000 without our prior written approval.

The following table shows the per share and total placement agent fees we will pay in connection with the sale of the securities in this offering, assuming the purchase of all of the securities we are offering.

Per share placement agent cash fees	\$ 0.240
Total	\$ 280,054

We estimate the total expenses of this offering, which will be payable by us, excluding the placement agent fees, will be approximately \$200,000. After deducting the fees due to the placement agent and our estimated offering expenses, we expect the net proceeds from this offering to be approximately \$3.0 million. We have agreed to indemnify Ladenburg Thalmann & Co. Inc. and certain other persons against certain liabilities relating to or arising out of Ladenburg Thalmann & Co. Inc.'s activities under the placement agency agreement. We have also agreed to contribute to payments Ladenburg Thalmann & Co. Inc. may be required to make in respect of such liabilities.

Ladenburg Thalmann & Co. Inc. 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 common stock and warrants sold by it while acting as principal might be deemed to be underwriting discounts or commissions under the Securities Act. As an underwriter, Ladenburg Thalmann & Co. Inc. 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 of common stock and warrants by Ladenburg Thalmann & Co. Inc. acting as principal. Under these rules and regulations, Ladenburg Thalmann & Co. Inc.:

S-19

Table of Contents

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.

A copy of the engagement letter, the form of securities purchase agreement we entered into with the purchasers and the form of warrant will be included as exhibits to our current report on Form 8-K that will be filed with the SEC in connection with the consummation of this offering.

The transfer agent for our common stock to be issued in this offering is Continental Stock Transfer & Trust Company. We will act as transfer agent for the warrants being offered hereby.

Our common stock is traded on the NASDAQ Capital Market under the symbol CBLI. The warrants to purchase common stock issued to the investors in this offering are not expected to be eligible for trading on any market.

LEGAL MATTERS

Cooley LLP, Boston, Massachusetts, will pass on the validity of the securities offered by this prospectus supplement. Ellenoff Grossman & Schole LLP, New York, New York, is counsel for the placement agent in connection with this offering.

EXPERTS

Meaden & Moore, Ltd., independent registered public accounting firm, has audited our consolidated financial statements included in our Annual Report on Form 10-K for the year ended December 31, 2013, and the effectiveness of our internal control over financial reporting as of December 31, 2013, as set forth in their reports, which are incorporated by reference in this prospectus supplement and elsewhere in the registration statement. Our financial statements and our management's assessment of the effectiveness of internal controls over financial reporting as of December 31, 2013 are incorporated by reference in reliance on Meaden & Moore, Ltd.'s reports, given on their authority as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We file reports, proxy statements and other documents with the SEC as required by the Exchange Act. You can find, copy and inspect information we file at the SEC's public reference room at 100 F Street, N.E., Washington, D.C. 20549. You can call the SEC at 1-800-SEC-0330 for further information about the public reference room. You can review our electronically filed reports, proxy and information statements on the SEC's web site at www.sec.gov or on our web site at www.cbiolabs.com. Information included on our web site is not part of this prospectus or any prospectus supplement.

This prospectus is part of a registration statement that we filed with the SEC. The registration statement contains more information than this prospectus regarding us and our securities, including exhibits and schedules. You can obtain a copy of the registration statement from the SEC at any address listed above or from the SEC's web site.

Table of Contents

INCORPORATION OF CERTAIN DOCUMENTS BY REFERENCE

The SEC allows us to incorporate into this prospectus supplement information that we file with the SEC in other documents. This means that we can disclose important information to you by referring to other documents that contain that information. Any information that we incorporate by reference is considered part of this prospectus supplement.

Information contained in this prospectus supplement and information that we file with the SEC in the future and incorporate by reference in this prospectus supplement automatically modifies and supersedes previously filed information including information in previously filed documents or reports that have been incorporated by reference in this prospectus supplement, to the extent the new information differs from or is inconsistent with the old information. Any information so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this prospectus supplement.

We incorporate by reference, as of their respective dates of filing, the documents listed below that we have filed with the SEC and any documents that we file with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act after the date of this prospectus supplement (except in each case the information contained in such documents to the extent furnished and not filed):

- (1) our Annual Report on Form 10-K for the year ended December 31, 2013, as filed with the SEC on March 17, 2014;
- (2) our Quarterly Report on Form 10-Q for the quarter ended March 31, 2014, as filed with the SEC on May 12, 2014;
- (3) our Quarterly Report on Form 10-Q for the quarter ended June 30, 2014, as filed with the SEC on August 11, 2014;
- (4) our Quarterly Report on Form 10-Q for the quarter ended September 30, 2014, as filed with the SEC on November 10, 2014;
- (5) our Current Reports on Form 8-K filed with the SEC on February 4, 2015, January 13, 2015, December 2, 2014, November 5, 2014, October 3, 2014, October 2, 2014, September 10, 2014, September 8, 2014, August 7, 2014, August 6, 2014, July 31, 2014, June 20, 2014, June 16, 2014, May 13, 2014, May 8, 2014, March 11, 2014, January 23, 2014 and January 15, 2014;
- (6) any other filings pursuant to the Exchange Act after the date of filing the initial registration statement and prior to the termination of the offering; and
- (7) the description of our common stock contained in our registration statement on Form 8-A filed with the SEC on July 20, 2006, including any amendments or reports filed for the purpose of updating that description.

You may request a copy of these documents, which will be provided to you at no cost, by writing or telephoning us using the following contact information:

Cleveland BioLabs, Inc.

73 High Street

Buffalo, New York 14203

Attention: Corporate Secretary

Telephone: (716) 849-6810

You should rely only on the information contained in this prospectus, including information incorporated by reference as described above, any accompanying prospectus supplement or any free writing prospectus we may authorize to be delivered to you. We have not authorized anyone to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it. You should not assume that the information in this prospectus or any prospectus supplement is accurate as of any date other than the date on the front of those documents or that any document incorporated by reference is accurate as of any date other than its filing date. You should not consider this prospectus to be an offer or solicitation relating to the securities.

S-21

Table of Contents

Cleveland BioLabs, Inc.

\$50,000,000

of

Common Stock

Warrants

We may from time to time offer and sell up to \$50,000,000 aggregate dollar amount of common stock and warrants. We will specify in one or more prospectus supplements the terms of the securities to be offered and sold. We may sell these securities to or through underwriters or dealers and also to other purchasers or through agents. We will set forth the names of any underwriters, dealers or agents in a prospectus supplement.

Our common stock is listed on The NASDAQ Capital Market under the symbol CBLI. The last reported sale price of our common stock on The NASDAQ Capital Market on December 9, 2013 was \$1.20 per share. As of December 9, 2013, the aggregate market value of the voting and non-voting common equity held by non-affiliates, computed by reference to the price at which the common equity was last sold or the average bid and asked price of such common equity on that date, was approximately \$51,163,337, based on 45,182,114 shares of outstanding common stock, of which 42,636,114 were held by non-affiliates. Pursuant to General Instruction I.B.6 of Form S-3, in no event will we sell securities in a public primary offering with a value exceeding more than one-third of our public float in any 12-month period so long as our public float remains below \$75.0 million. 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.

Investing in our securities involves a high degree of risk. See Risk Factors on page 4.

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.

This prospectus may not be used to consummate sales of securities unless, to the extent required by applicable law, it is accompanied by a prospectus supplement.

Prospectus dated January 10, 2014.

Table of Contents

TABLE OF CONTENTS

	Page
<u>ABOUT THIS PROSPECTUS</u>	ii
<u>SUMMARY</u>	1
<u>RISK FACTORS</u>	4
<u>SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS</u>	4
<u>USE OF PROCEEDS</u>	4
<u>RATIO OF EARNINGS TO FIXED CHARGES</u>	5
<u>DILUTION</u>	5
<u>DESCRIPTION OF SECURITIES</u>	5
<u>DESCRIPTION OF COMMON STOCK</u>	6
<u>DESCRIPTION OF WARRANTS</u>	8
<u>LEGAL OWNERSHIP OF SECURITIES</u>	10
<u>PLAN OF DISTRIBUTION</u>	13
<u>LEGAL MATTERS</u>	16
<u>EXPERTS</u>	16
<u>WHERE YOU CAN FIND MORE INFORMATION</u>	16
<u>INCORPORATION OF CERTAIN DOCUMENTS BY REFERENCE</u>	16

You should rely only on the information contained or incorporated by reference in this prospectus, any accompanying prospectus supplement or any free writing prospectus we may authorize to be delivered to you. We have not authorized anyone to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it. You should assume that the information appearing in this prospectus, any prospectus supplement and the documents incorporated by reference herein and therein are accurate only as of their respective dates. Our business, financial condition, results of operations and prospects may have changed since those dates. Neither this prospectus nor any accompanying prospectus supplement shall constitute 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 anyone to whom it is unlawful to make such offer or solicitation.

Table of Contents

ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement that we filed with the Securities and Exchange Commission, or the SEC, using a shelf registration process. Under this shelf registration process, we may from time to time sell common stock and warrants, or any combination of these securities, in one or more offerings up to a total dollar amount of \$50,000,000. We have provided to you in this prospectus a general description of the securities we may offer. Each time we sell securities, we will, to the extent required by law, provide a prospectus supplement that will contain specific information about the terms of the offering. We may also add, update or change in any accompanying prospectus supplement or any free writing prospectus we may authorize to be delivered to you any of the information contained in this prospectus. To the extent there is a conflict between the information contained in this prospectus and the prospectus supplement, you should rely on the information in the prospectus supplement, provided that if any statement in one of these documents is inconsistent with a statement in another document having a later date for example, a document incorporated by reference in this prospectus or any prospectus supplement the statement in the document having the later date modifies or supersedes the earlier statement. This prospectus, together with any accompanying prospectus supplement and any free writing prospectus we may authorize to be delivered to you, includes all material information relating to the offering of our securities.

As permitted by the rules and regulations of the SEC, the registration statement, of which this prospectus forms a part, includes additional information not contained in this prospectus. You may read the registration statement and the other reports we file with the SEC at the SEC's web site or at the SEC's offices described below under the heading Where You Can Find More Information.

In this prospectus, unless otherwise stated or the context otherwise requires, the terms Cleveland BioLabs and CBLI refer to Cleveland BioLabs, Inc., but not its consolidated subsidiaries and the Company, we, us and our refer to Cleveland BioLabs, Inc. together with its consolidated subsidiaries. Each of the trade names or service marks appearing or incorporated by reference in this prospectus or any applicable prospectus supplement are the property of their respective owners.

Table of Contents**SUMMARY****The Company**

We are a clinical-stage biotechnology company with a focus on oncology drug development. Our lead drug Entolimod (generic name for CBLB502) is being developed for dual indications under (a) the U.S. Food & Drug Administration's (FDA's) Animal Efficacy Rule (21 CFR §314.610 drugs; §601.91 biologics), commonly referred to as the Animal Rule, as a radiation countermeasure, and (b) under the FDA's traditional drug approval pathway as a targeted cancer treatment. CBLI is a Delaware corporation and was founded in 2003. Since our inception, we have pursued the research, development and commercialization of products that have the potential to treat cancer, reduce death from total body irradiation, and counteract the genotoxic effects of radio- and chemotherapies for oncology patients. Presently, nine product candidates are under development directly by our wholly-owned subsidiary, BioLab 612, LLC, and our majority-owned subsidiaries, Incuron, LLC (Incuron) and Panacela Labs, Inc. (Panacela). An illustration of our product pipeline follows:

Product			Development
Candidate Entolimod*	Indication Radiation Countermeasure	Description Radioprotectant and mitigating agent targeting increased survival from lethal exposure	Stage Pivotal stage
Entolimod	Targeted Cancer Treatment	TLR5 agonist inducing innate immune response to targeted tumor types and liver metastases	Phase 1
CBLB612	Neutropenia/HSCT**	Hematopoietic stem cell inducer and mobilizer to peripheral blood	Pre-clinical
<i>Incuron Product Candidates</i>			
CBL0102	Hepatocellular Carcinoma	Quinacrine	Phase 1
CBL0137	Cancer Treatment	Small molecule targeting FACT***	Phase 1
<i>Panacela Product Candidates</i>			
Revercom	Cancer Treatment	Chemotherapy adjuvant	Pre-clinical
Mobilan	Cancer Treatment	Immunotherapy	Pre-clinical
Arkil	Targeted Cancer Treatment	Inhibitor of Androgen receptor	Pre-clinical
Antimycon	Targeted Cancer Treatment	Inhibitor of Myc oncogene	Pre-clinical
Xenomycins	Anti-Infective	Small molecules targeting FACT***	Pre-clinical

* We currently intend to rely on the Animal Rule in seeking marketing approval for this indication. Under the Animal Rule, if human efficacy trials are not ethical or feasible, the FDA can approve drugs or biologics used to treat or prevent serious or life threatening conditions caused by exposure to lethal or permanently disabling toxic chemical, biological, radiological, or nuclear substances based on human clinical data demonstrating safety and evidence of efficacy from appropriate animal studies and any additional supporting data.

** HSCT means hematopoietic stem cell transplant

*** FACT means chromatin remodeling complex named Facilitates Chromatin Transcription

We have successfully negotiated contracts and grants with the U.S. government totaling \$85.9 million for the development and procurement of our lead compound, Entolimod, for biodefense application as a radiation countermeasure. Of this \$85.9 million, we have received development funding of approximately \$44.6 million, of which we have recognized approximately \$44.1 million in revenue through September 30, 2013. As of September 30, 2013, the federal government has the potential to fund an additional \$41.4 million under our existing contracts and grants, including a \$30 million procurement option that becomes exercisable upon FDA approval. Our current contracts with the Department of Defense, including those contracts providing for the \$30 million procurement

Table of Contents

option, expire in December 2013. We are currently pursuing extensions of these contracts. We have performed extensive safety and efficacy studies in non-human primates (NHPs) and rodents and have evaluated Entolimod s safety profile in 150 healthy human volunteers. We have submitted a proposal to the Biomedical Advanced Research and Development Agency of the Department of Health and Human Services to fund the remaining work necessary to complete a dossier of information needed to submit a Biologic License Application, or BLA, to the FDA for marketing approval. This remaining work includes: animal efficacy trials, human safety trials and biostatistical data needed to confirm proper dose conversion between NHPs and humans.

In October 2013, we received a contract valued at approximately 149 million rubles (approximately \$4.6 million) from the Ministry of Industry and Trade of the Russian Federation to support the clinical safety and efficacy assessment of Entolimod in colorectal cancer.

A Phase 1 trial evaluating the safety and pharmacokinetic and pharmacodynamic profile of Entolimod in refractory patients with advanced cancers, many of whom evidence liver metastases is underway at Roswell Park Cancer Institute. Evaluation of the effect that Entolimod has on metastasized tumor lesions in the liver is a secondary endpoint. CBLB612, an inducer and mobilizer of hematopoietic stem cells, or HSCs, is also actively being developed and is currently undergoing formal pre-clinical safety assessment and cGMP-manufacturing development. In mid-2012, we received a contract valued at 139 million rubles (approximately \$4.4 million) from the Ministry of Industry and Trade of the Russian Federation for development of CBLB612. In the third quarter of 2013, we submitted an Investigational New Drug Application for CBLB612 in the Russian Federation.

In December 2009, we entered into a Participation Agreement with BioProcess Capital Partners, LLC, a Russian Federation venture capital fund, to create a joint venture, Incuron, to develop our Curaxin line of anti-cancer product candidates: specifically CBL0102, a nonproprietary molecule originally used to combat the effects of malaria, which we identified as having cancer treatment properties; and CBL0137, a new, proprietary molecule optimized to better target similar mechanisms of action in combating cancer. Incuron is our majority owned subsidiary, with approximately 59.2% of its equity interests held by us at September 30, 2013. Our Curaxin research is supported by a 150 million ruble (approximately \$4.7 million) grant from the Russian Federation Government initiative Skolkovo , which was awarded in late 2011.

CBL0102 is currently undergoing a Phase 1 safety and tolerability study in patients with liver metastases of solid tumors of epithelial origin, or primary advanced hepatic carcinoma for which standard therapy has failed or does not exist in the Russian Federation.

In October 2012, dosing was started with the oral formulation of CBL0137 in a multi-center, single agent, dose escalation study in subjects with advanced solid tumors that are resistant or refractory to standard of care treatment in the Russian Federation. In August 2013, dosing was started in a multi-center, single agent dose escalation study evaluating intravenous administration of CBL0137 in patients with metastatic or unresectable advanced solid cancers and lymphomas.

In September 2011, we entered into an Investment Agreement with Open Joint Stock Company Rusnano , or Rusnano, a multi-billion Russian Federation fund, governing the creation of Panacela, a joint venture company formed to develop five separate product candidates, all of which were in pre-clinical development at the end of 2012. Panacela is a majority-owned subsidiary, with 54.6% of its shares held by us at September 30, 2013. In late 2012, Panacela received a contract valued at 146 million rubles (approximately \$4.6 million) from the Ministry of Industry and Trade of the Russian Federation for the development of a family of anti-infective compounds known as Xenomycins. Additionally, in October 2013, Panacela entered into a three-year contract valued at approximately 149 million rubles (approximately \$4.6 million) with the Ministry of Industry and Trade of the Russian Federation to support preclinical

and clinical studies of Mobilan, a cancer vaccine in preclinical development.

Additionally, we leverage close development relationships with Roswell Park Cancer Institute, Cleveland Clinic Foundation and Children's Cancer Institute Australia. Together, our team of legal entities, financial partners and other collaborators engage in the collective development efforts necessary to advance all of our product candidates towards marketing approval and commercialization.

Table of Contents

Corporate Information

We were incorporated in Delaware on June 5, 2003. We conduct operations through several subsidiaries, including our wholly-owned subsidiary, BioLab 612, LLC, and our majority-owned subsidiaries, Incuron, LLC and Panacela Labs, Inc.

Our principal executive offices are located at 73 High Street, Buffalo, New York 14203. Our telephone number is (716) 849-6810. Our website address is www.cbiolabs.com. We have included our website address as an inactive textual reference only. The information contained on, or that can be accessed through, our website is not a part of this prospectus.

Table of Contents

RISK FACTORS

Investing in our securities involves significant risks. Before making an investment decision, you should carefully consider the risks and other information we include or incorporate by reference in this prospectus and any prospectus supplement. In particular, you should consider the risk factors under the heading Risk Factors included in our most recent Annual Report on Form 10-K, as revised or supplemented by our subsequent Quarterly Reports on Form 10-Q, each of which are on file with the SEC and are incorporated herein by reference, and which may be amended, supplemented or superseded from time to time by other reports we file with the SEC in the future. The risks and uncertainties we have described are not the only ones facing our company. Additional risks and uncertainties not currently known to us or that we currently deem immaterial may also affect our business operations. Additional risk factors may be included in a prospectus supplement relating to a particular offering of securities.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus, any prospectus supplement and the documents incorporated by reference herein contain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act, that involve substantial risks and uncertainties. All statements, other than statements of historical fact, including statements regarding our strategy, future operations, future financial position, future revenues, projected costs, prospects, plans and objectives of management, are forward-looking statements. The words anticipate, believe, continue, should, estimate, expect, intend, may, plan, project, will, and similar expressions are intended to identify forward-statements, although not all forward-looking statements contain these identifying words.

We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements, and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements we make. We have included important factors in the cautionary statements included and incorporated by reference in this prospectus that we believe could cause actual results or events to differ materially from the forward-looking statements that we make. See the section entitled Risk Factors herein for more information. You should consider these factors and other cautionary statements made in this prospectus and in the documents we incorporate by reference as being applicable to all related forward-looking statements wherever they appear in the prospectus and in the documents incorporated by reference. Unless specifically indicated, our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures or investments we may make. We do not assume any obligation to update any forward-looking statements.

USE OF PROCEEDS

Unless otherwise provided in the applicable prospectus supplement, we currently intend to use the net proceeds from the sale of the securities from offerings under this prospectus for general corporate purposes, including continued development of our product candidates, working capital and capital expenditures. We may set forth additional information on the use of proceeds from the sale of securities we offer under this prospectus in a prospectus supplement relating to the specific offering. We have not determined the amount of net proceeds to be used specifically for the foregoing purposes. As a result, our management will have broad discretion in the allocation of the net proceeds. Pending use of the net proceeds, we intend to invest the proceeds in a variety of capital preservation instruments, including short-term, investment-grade, interest-bearing instruments.

Table of Contents**RATIO OF EARNINGS TO FIXED CHARGES**

Our earnings were insufficient to cover fixed charges in each of the years ended December 31, 2008, 2009, 2010, 2011 and 2012 and in the nine months ended September 30, 2013. Accordingly, the following table sets forth the deficiency of earnings to cover fixed charges for each of the foregoing periods. Because of the deficiency, ratio information is not applicable.

	2008	2009	2010	2011	2012	Nine Months Ended September 30, 2013
Earnings	\$ (14,025,927)	\$ (12,826,409)	\$ (26,671,857)	\$ (5,229,725)	\$ (22,414,640)	\$ (19,284,530)
Ratio of earnings to fixed charges	N/A	N/A	N/A	N/A	N/A	N/A
Deficiency of earnings available to cover fixed charges	\$ (13,959,410)	\$ (12,750,928)	\$ (26,602,713)	\$ (5,150,392)	\$ (22,299,102)	\$ (19,162,642)

For purposes of computing the deficiency of earnings to cover fixed charges, earnings consist of loss from operations before income taxes and fixed charges. Fixed charges consist of interest expense, capitalized interest, amortization of capitalized interest and the portion of operating lease expense that represents interest.

As of the date of this prospectus, we have no shares of preferred stock outstanding and have not declared or paid any preferred stock dividends for the periods set forth above. Accordingly, a ratio of earnings to fixed charges is being presented in lieu of a ratio of earnings to combined fixed charges and preferred stock dividends.

DILUTION

We will set forth in a prospectus supplement the following information regarding any material dilution of the equity interests of investors purchasing securities in an offering under this prospectus:

the net tangible book value per share of our equity securities before and after the offering;

the amount of the increase in such net tangible book value per share attributable to the cash payments made by purchasers in the offering; and

the amount of the immediate dilution from the public offering price which will be absorbed by such purchasers.

DESCRIPTION OF SECURITIES

The descriptions of the securities contained in this prospectus, together with the applicable prospectus supplements, summarize the material terms and provisions of the various types of securities that we may offer. We will describe in

the applicable prospectus supplement relating to any securities the particular terms of the securities offered by that prospectus supplement. If we so indicate in the applicable prospectus supplement, the terms of the securities may differ from the terms we have summarized below. We will also include in the prospectus supplement information, where applicable, about material U.S. federal income tax considerations relating to the securities, and the securities exchange, if any, on which the securities will be listed.

Table of Contents

We may sell from time to time, in one or more offerings, common stock and warrants to purchase any such securities.

In this prospectus, we refer to the common stock and warrants to be sold by us in an offering collectively as securities. The total dollar amount of all securities that we may issue under this prospectus will not exceed \$50,000,000.

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

DESCRIPTION OF COMMON STOCK

The following description of our common stock, together with any additional information we include in any applicable prospectus supplements, summarizes the material terms and provisions of our common stock that we may offer in offerings under this prospectus. For the complete terms of our common stock, please refer to our certificate of incorporation and by-laws, which are exhibits to the registration statement that includes this prospectus. The terms of our common stock may also be affected by Delaware law.

Authorized Capital Stock

Under our certificate of incorporation, our authorized capital stock consists of 160,000,000 shares of common stock, \$0.005 par value per share, and 10,000,000 shares of preferred stock, \$0.005 par value per share. As of December 9, 2013, we had 45,182,114 shares of common stock outstanding and no shares of preferred stock outstanding. We will describe the specific terms of any common stock we may offer in more detail in a prospectus supplement relating to the offering of shares of common stock. If we so indicate in a prospectus supplement, the terms of any common stock offered under that prospectus supplement may differ from the terms described below.

Common Stock

Voting Rights. The holders of our common stock are entitled to one vote per share with respect to each matter presented to our stockholders on which the holders of common stock are entitled to vote and do not have cumulative voting rights. An election of directors by our stockholders is determined by a plurality of the votes cast by the stockholders entitled to vote on the election.

Dividends. Holders of common stock are entitled to receive ratably any dividends as may be declared by our board of directors, subject to any preferential dividend rights of outstanding preferred stock.

Liquidation and Dissolution. In the event of our liquidation or dissolution, the holders of common stock are entitled to receive ratably all assets available for distribution to stockholders after the payment of all debts and other liabilities and subject to the prior rights of any outstanding preferred stock.

Other Rights. Holders of common stock have no preemptive, subscription, redemption or conversion rights. The rights, preferences and privileges of holders of common stock are subject to and may be adversely affected by the rights of the holders of shares of any series of preferred stock that we may designate and issue in the future.

Listing. Our common stock is listed on The NASDAQ Capital Market under the symbol CBLI. As of December 9, 2013 the closing price per share of our common stock on The NASDAQ Capital Market was \$1.20, and we had approximately 33 holders of record of our common stock.

Transfer Agent and Registrar. The transfer agent and registrar for our common stock is Continental Stock Transfer & Trust Company.

Table of Contents**Anti-Takeover Effects of Delaware Law and our Certificate of Incorporation and By-laws**

The provisions of Delaware law, our certificate of incorporation and our bylaws, which are discussed below, could discourage or make it more difficult to accomplish a proxy contest or other change in our management or the acquisition of control by a holder of a substantial amount of our voting stock. It is possible that these provisions could make it more difficult to accomplish, or could deter, transactions that stockholders may otherwise consider to be in their best interests or the best interests of the company. These provisions are intended to enhance the likelihood of continuity and stability in the composition of our board of directors and in the policies formulated by the board of directors and to discourage certain types of transactions that may involve an actual or threatened change of control of us. These provisions are also designed to reduce our vulnerability to an unsolicited acquisition proposal and to discourage certain tactics that may be used in proxy fights. Such provisions also may have the effect of preventing changes in our management.

Delaware Law

We are subject to the anti-takeover provisions of Section 203 of the Delaware General Corporation Law, or DGCL. In general, Section 203 prohibits a publicly-held Delaware corporation from engaging in a business combination with an interested stockholder for a period of three years after the date of the transaction in which the person became an interested stockholder, unless the business combination is, or the transaction in which the person became an interested stockholder was, approved in a prescribed manner or another prescribed exception applies. For purposes of Section 203, a business combination is defined broadly to include a merger, asset sale or other transaction resulting in a financial benefit to the interested stockholder, and, subject to certain exceptions, an interested stockholder is a person who, together with his or her affiliates and associates, owns, or within three years prior, did own, 15% or more of the corporation's voting stock.

Stockholder Action; Special Meeting of Stockholders; Advance Notice Requirements for Stockholder Proposals and Director Nominations

Our certificate of incorporation and bylaws do not permit our stockholders to act by written consent. As a result, any action to be effected by our stockholders must be effected at a duly called annual or special meeting of the stockholders. Our certificate of incorporation and our bylaws also provide that special meetings of the stockholders may be called only by (i) our Chairman of the board of directors and (ii) our board of directors. Our bylaws provide that, for nominations to the board of directors or for other business to be properly brought by a stockholder before a meeting of stockholders, the stockholder must first have given timely notice of the proposal in writing to our Secretary. For an annual meeting, a stockholder's notice generally must be delivered not less than 90 days nor more than 120 days prior to the anniversary of the date of previous year's annual meeting; provided, however, that in the event that the annual meeting is called for a date that is not within 30 days before or after such anniversary date, notice by the stockholder in order to be timely must be received not later than the 10th day following the day on which such notice of the date of the annual meeting was mailed or public disclosure was made, whichever occurs first. Detailed requirements as to the form of the notice and information required in the notice are specified in the bylaws. If it is determined that business was not properly brought before a meeting in accordance with our bylaws, such business will not be conducted at the meeting.

Effects of Authorized but Unissued Stock

We have shares of common stock and preferred stock available for future issuance without stockholder approval, subject to any limitations imposed by the listing standards of The NASDAQ Capital Market. We may utilize these additional shares for a variety of corporate purposes including for future public offerings to raise additional capital or

facilitate corporate acquisitions or for payment as a dividend on our capital stock. The existence of unissued and unreserved common stock and preferred stock may enable our board of directors to issue shares to persons friendly to current management or to issue preferred stock with terms that could have the effect of making it more difficult for a third party to acquire, or could discourage a third party from seeking to acquire, a controlling

Table of Contents

interest in our company by means of a merger, tender offer, proxy contest or otherwise. 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.

Limitation of Liability and Indemnification of Officers and Directors

Our certificate of incorporation contains provisions permitted under the DGCL relating to the liability of directors. The provisions eliminate a director's liability for monetary damages for a breach of fiduciary duty, except in circumstances involving wrongful acts, such as the breach of a director's duty of loyalty or acts or omissions not in good faith or that involve intentional misconduct or a knowing violation of law. Further, our certificate of incorporation contains provisions to indemnify our directors and officers to the fullest extent permitted by the DGCL. We have also entered into indemnification agreements with certain of our current and former directors and certain of our officers and expect to enter into a similar agreement with any new directors or officers.

DESCRIPTION OF WARRANTS

The following description, together with the additional information we may include in any applicable prospectus supplements, summarizes the material terms and provisions of the warrants that we may offer in an offering under this prospectus and the related warrant agreements and warrant certificates. While the terms summarized below will apply generally to any warrants that we may offer, we will describe the particular terms of any series of warrants in more detail in the applicable prospectus supplement. If we so indicate in the prospectus supplement, the terms of any warrants offered under that prospectus supplement may differ from the terms described below. Specific warrant agreements will contain additional important terms and provisions and will be incorporated by reference as an exhibit to the registration statement that includes this prospectus.

General

We may issue warrants for the purchase of common stock in one or more series. We may issue warrants independently or together with common stock, and the warrants may be attached to or separate from these securities.

We will evidence each series of warrants by warrant certificates that we will issue under a separate agreement. We may enter into the warrant agreement with a warrant agent. We will indicate the name and address and other information regarding the warrant agent in the applicable prospectus supplement relating to a particular series of warrants.

If we decide to issue warrants pursuant to this prospectus, we will specify in a prospectus supplement the terms of the series of warrants, including, if applicable, the following:

the offering price and aggregate number of warrants offered;

the currency for which the warrants may be purchased;

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;

the date on and after which the warrants and the related securities will be separately transferable;

the number of shares of common stock purchasable upon the exercise of the warrants 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 agreement and the warrants;

Table of Contents

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 agreement and warrants may be modified;

a discussion of any material U.S. 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 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.

Exercise of Warrants

Each warrant will entitle the holder to purchase the securities that we specify in the applicable prospectus supplement at the exercise price that we describe in the applicable prospectus supplement. Unless we otherwise specify in the applicable prospectus supplement, holders of the warrants may exercise the warrants at any time up to 5:00 p.m. New York City time on the expiration date that we set forth in the applicable prospectus supplement. After the close of business on the expiration date, unexercised warrants will become void.

Holders of the warrants may exercise the warrants by delivering the warrant certificate representing the warrants to be exercised together with specified information, and paying the required amount to the warrant agent in immediately available funds, as provided in the applicable prospectus supplement. We will set forth on the reverse side of the warrant certificate and in the applicable prospectus supplement the information that the holder of the warrant will be required to deliver to the warrant agent.

Upon receipt of the required payment and the warrant certificate properly completed and duly executed at the corporate trust office of the warrant agent or any other office indicated in the applicable prospectus supplement, we will issue and deliver the securities purchasable upon such exercise. If fewer than all of the warrants represented by the warrant certificate are exercised, then we will issue a new warrant certificate for the remaining amount of warrants. If we so indicate in the applicable prospectus supplement, holders of the warrants may surrender securities as all or part of the exercise price for warrants.

Enforceability of Rights by Holders of Warrants

Each warrant agent will act solely as our agent under the applicable warrant agreement and will not assume any obligation or relationship of agency or trust with any holder of any warrant. A single bank or trust company may act as warrant agent for more than one issue of warrants. A warrant agent will have no duty or responsibility in case of any default by us under the applicable warrant agreement or warrant, including any duty or responsibility to initiate any proceedings at law or otherwise, or to make any demand upon us. Any holder of a warrant may, without the consent of the related warrant agent or the holder of any other warrant, enforce by appropriate legal action its right to exercise, and receive the securities purchasable upon exercise of, its warrants.

Table of Contents

LEGAL OWNERSHIP OF SECURITIES

We can issue securities in registered form or in the form of one or more global securities. We describe global securities in greater detail below. We refer to those persons who have securities registered in their own names on the books that we or any applicable trustee maintain for this purpose as the holders of those securities. These persons are the legal holders of the securities. We refer to those persons who, indirectly through others, own beneficial interests in securities that are not registered in their own names, as indirect holders of those securities. As we discuss below, indirect holders are not legal holders, and investors in securities issued in book-entry form or in street name will be indirect holders.

Book-Entry Holders

We may issue securities in book-entry form only, as we will specify in the applicable prospectus supplement. This means securities may be represented by one or more global securities registered in the name of a financial institution that holds them as depository on behalf of other financial institutions that participate in the depository's book-entry system. These participating institutions, which are referred to as participants, in turn, hold beneficial interests in the securities on behalf of themselves or their customers.

Only the person in whose name a security is registered is recognized as the holder of that security. Securities issued in global form will be registered in the name of the depository or its nominee. Consequently, for securities issued in global form, we will recognize only the depository as the holder of the securities, and we will make all payments on the securities to the depository. The depository passes along the payments it receives to its participants, which in turn pass the payments along to their customers who are the beneficial owners. The depository and its participants do so under agreements they have made with one another or with their customers; they are not obligated to do so under the terms of the securities.

As a result, investors in a book-entry security will not own securities directly. Instead, they will own beneficial interests in a global security, through a bank, broker or other financial institution that participates in the depository's book-entry system or holds an interest through a participant. As long as the securities are issued in global form, investors will be indirect holders, and not holders, of the securities.

Street Name Holders

We may terminate a global security or issue securities in non-global form. In these cases, investors may choose to hold their securities in their own names or in street name. Securities held by an investor in street name would be registered in the name of a bank, broker or other financial institution that the investor chooses, and the investor would hold only a beneficial interest in those securities through an account he or she maintains at that institution.

For securities held in street name, we will recognize only the intermediary banks, brokers and other financial institutions in whose names the securities are registered as the holders of those securities, and we will make all payments on those securities to them. These institutions pass along the payments they receive to their customers who are the beneficial owners, but only because they agree to do so in their customer agreements or because they are legally required to do so. Investors who hold securities in street name will be indirect holders, not holders, of those securities.

Legal Holders

Our obligations, as well as the obligations of any applicable trustee and of any third parties employed by us or a trustee, run only to the legal holders of the securities. We do not have obligations to investors who hold beneficial interests in global securities, in street name or by any other indirect means. This will be the case whether an investor chooses to be an indirect holder of a security or has no choice because we are issuing the securities only in global form. For example, once we make a payment or give a notice to the holder, we have no further responsibility for the payment or notice even if that holder is required, under agreements with depositary participants or customers or by law, to pass it along to the indirect holders but does not do so.

Table of Contents

Special Considerations For Indirect Holders

If you hold securities through a bank, broker or other financial institution, either in book-entry form or in street name, you should check with your own institution to find out:

how it handles securities payments and notices;

whether it imposes fees or charges;

how it would handle a request for the holders' consent, if ever required;

whether and how you can instruct it to send you securities registered in your own name so you can be a holder, if that is permitted in the future;

how it would exercise rights under the securities if there were a default or other event triggering the need for holders to act to protect their interests; and

if the securities are in book-entry form, how the depository's rules and procedures will affect these matters.

Global Securities

A global security is a security held by a depository that represents one or any other number of individual securities. Generally, all securities represented by the same global securities will have the same terms.

Each security issued in book-entry form will be represented by a global security that we deposit with and register in the name of a financial institution or its nominee that we select. The financial institution that we select for this purpose is called the depository. Unless we specify otherwise in the applicable prospectus supplement, The Depository Trust Company, or DTC, will be the depository for all securities issued in book-entry form.

A global security may not be transferred to or registered in the name of anyone other than the depository, its nominee or a successor depository, unless special termination situations arise. We describe those situations below under **Special Situations When a Global Security Will Be Terminated**. As a result of these arrangements, the depository, or its nominee, will be the sole registered owner and holder of all securities represented by a global security, and investors will be permitted to own only beneficial interests in a global security. Beneficial interests must be held by means of an account with a broker, bank or other financial institution that in turn has an account with the depository or with another institution that does. Thus, an investor whose security is represented by a global security will not be a holder of the security, but only an indirect holder of a beneficial interest in the global security.

If the prospectus supplement for a particular security indicates that the security will be issued in global form only, then the security will be represented by a global security at all times unless and until the global security is terminated. If termination occurs, we may issue the securities through another book-entry clearing system or decide that the securities may no longer be held through any book-entry clearing system.

Special Considerations For Global Securities

As an indirect holder, an investor's rights relating to a global security will be governed by the account rules of the investor's financial institution and of the depositary, as well as general laws relating to securities transfers. We do not recognize an indirect holder as a holder of securities and instead deal only with the depositary that holds the global security.

Table of Contents

If securities are issued only in the form of a global security, an investor should be aware of the following:

an investor cannot cause the securities to be registered in his or her name, and cannot obtain non-global certificates for his or her interest in the securities, except in the special situations we describe below;

an investor will be an indirect holder and must look to his or her own bank or broker for payments on the securities and protection of his or her legal rights relating to the securities, as we describe under "Legal Holders" above;

an investor may not be able to sell interests in the securities to some insurance companies and to other institutions that are required by law to own their securities in non-book-entry form;

an investor may not be able to pledge his or her interest in a global security in circumstances where certificates representing the securities must be delivered to the lender or other beneficiary of the pledge in order for the pledge to be effective;

the depositary's policies, which may change from time to time, will govern payments, transfers, exchanges and other matters relating to an investor's interest in a global security. We and any applicable trustee have no responsibility for any aspect of the depositary's actions or for its records of ownership interests in a global security. We and the trustee also do not supervise the depositary in any way;

the depositary may, and we understand that DTC will, require that those who purchase and sell interests in a global security within its book-entry system use immediately available funds, and your broker or bank may require you to do so as well; and

financial institutions that participate in the depositary's book-entry system, and through which an investor holds its interest in a global security, may also have their own policies affecting payments, notices and other matters relating to the securities. There may be more than one financial intermediary in the chain of ownership for an investor. We do not monitor and are not responsible for the actions of any of those intermediaries.

Special Situations When A Global Security Will Be Terminated

In a few special situations described below, the global security will terminate and interests in it will be exchanged for physical certificates representing those interests. After that exchange, the choice of whether to hold securities directly or in street name will be up to the investor. Investors must consult their own banks or brokers to find out how to have their interests in securities transferred to their own name, so that they will be direct holders. We have described the rights of holders and street name investors above.

The global security will terminate when the following special situations occur:

if the depositary notifies us that it is unwilling, unable or no longer qualified to continue as depositary for that global security and we do not appoint another institution to act as depositary within 90 days;

if we notify any applicable trustee that we wish to terminate that global security; or

if an event of default has occurred with regard to securities represented by that global security and has not been cured or waived.

The prospectus supplement may also list additional situations for terminating a global security that would apply only to the particular series of securities covered by the prospectus supplement. When a global security terminates, the depositary, and not we or any applicable trustee, is responsible for deciding the names of the institutions that will be the initial direct holders.

Table of Contents

PLAN OF DISTRIBUTION

We may sell the securities under this prospectus in one or more of the following ways from time to time:

through agents;

to or through underwriters;

through dealers;

directly to purchasers; or

through a combination of these methods of sale.

The securities that we distribute by any of these methods may be sold, in one or more transactions, at:

a fixed price or prices, which may be changed;

market prices prevailing at the time of sale;

prices related to prevailing market prices;

negotiated prices; or

a combination of these pricing methods.

Offers to purchase offered securities may be solicited by agents designated by us from time to time. Any agent involved in the offer or sale of the offered securities in respect of which this prospectus is delivered will be named, and any commissions payable by us will be set forth, in the applicable prospectus supplement. Unless otherwise set forth in the applicable prospectus supplement, any agent will be acting on a reasonable best efforts basis for the period of its appointment. Any agent may be deemed to be an underwriter, as that term is defined in the Securities Act, of the offered securities so offered and sold.

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

the name or names of any agents, underwriters or dealers;

the purchase price of our 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 commissions and other items constituting agents or underwriters' compensation;

the public offering price;

any discounts or concessions allowed or reallocated or paid to dealers; and

any securities exchanges on which such securities may be listed.

Table of Contents

If offered securities are sold to the public by means of an underwritten offering, either through underwriting syndicates represented by managing underwriters or directly by the managing underwriters, we will execute an underwriting agreement with an underwriter or underwriters, and the names of the specific managing underwriter or underwriters, as well as any other underwriters, will be set forth in the applicable prospectus supplement. In addition, the terms of the transaction, including commissions, discounts and any other compensation of the underwriters and dealers, if any, will be set forth in the applicable prospectus supplement, which prospectus supplement will be used by the underwriters to make resales of the offered securities. If underwriters are utilized in the sale of the offered securities, the offered securities will be acquired by the underwriters for their own account and may be resold from time to time in one or more transactions, including:

negotiated transactions;

at fixed public offering prices; or

at varying prices determined by the underwriters at the time of sale.

In addition, unless otherwise indicated in the prospectus supplement, the underwriting agreement will provide that the obligations of the underwriters are subject to specified conditions precedent and that the underwriters with respect to a sale of offered securities will be obligated to purchase all of the offered securities of a series if any are purchased.

We may grant to the underwriters options to purchase additional offered securities to cover over-allotments, if any, at the public offering price with additional underwriting discounts or commissions, as may be set forth in the applicable prospectus supplement. If we grant any over-allotment option, the terms of the over-allotment option will be set forth in the applicable prospectus supplement.

If a dealer is utilized in the sales of offered securities, we will sell the offered securities to the dealer as principal. The dealer may then resell the offered securities to the public at varying prices to be determined by the dealer at the time of resale. Any dealer may be deemed to be an underwriter of the offered securities so offered and sold. The name of the dealer and the terms of the transaction will be set forth in the applicable prospectus supplement.

We may directly solicit offers to purchase offered securities and sell offered securities directly to institutional investors or others with respect to any resale of the offered securities. The terms of any of these sales will be described in the applicable prospectus supplement.

Offered securities may also be offered and sold in connection with a remarketing upon their purchase, in accordance with a redemption or repayment pursuant to their terms, or otherwise by one or more remarketing firms acting as principals for their own accounts or as agents for us. Any remarketing firm will be identified and the terms of its agreements, if any, with us and its compensation will be described in the applicable prospectus supplement. Remarketing firms may be deemed to be underwriters in connection with the offered securities remarketed by them.

Agents, underwriters, dealers and remarketing firms may be entitled, under agreements entered into with us, to indemnification by us against specified civil liabilities, including liabilities under the Securities Act that may arise from any untrue statement or alleged untrue statement of a material fact or any omission or alleged omission to state a material fact in this prospectus, any supplement or amendment hereto, or in the registration statement of which this prospectus forms a part, or to contribution with respect to payments which the agents, underwriters or dealers may be

required to make.

Table of Contents

We may authorize underwriters or other persons acting as agents to solicit offers by specified institutions to purchase offered securities pursuant to contracts providing for payments and delivery on a future date, which will be set forth in the applicable prospectus supplement. Institutions with which these contracts may be made include commercial and savings banks, insurance companies, pension funds, investment companies, educational and charitable institutions and others. However, in all cases, these institutions must be approved by us. The obligations of any purchaser under any contract will be subject to the condition that the purchase of the offered securities shall not, at the time of delivery, be prohibited under the laws of the jurisdiction to which the purchaser is subject. The underwriters and other agents will not have any responsibility in respect of the validity or performance of these contracts.

Underwriters, dealers, agents and remarketing firms may be customers of, engage in transactions with, or perform services for, us in the ordinary course of business for which they have received or will continue to receive customary compensation.

Unless otherwise specified in the applicable prospectus supplement, each class or series of securities will be a new issue with no established trading market, other than our common stock, which is traded on The NASDAQ Capital Market. We may elect to list any other class or series of securities on any exchange and, in the case of our common stock, on any additional exchange. However, unless otherwise specified in the applicable prospectus supplement, we will not be obligated to do so. It is possible that one or more underwriters may make a market in a class or series of securities, but the underwriters will not be obligated to do so and may discontinue any market making at any time without notice. We cannot give any assurance as to the liquidity of the trading market for any of the offered securities.

In connection with an offering, an underwriter may purchase and sell securities in the open market. These transactions may include short sales, stabilizing transactions and purchases to cover positions created by short sales. Short sales involve the sale by the underwriters of a greater number of securities than they are required to purchase in the offering. Covered short sales are sales made in an amount not greater than the underwriters' option to purchase additional securities from us, if any, in the offering. If the underwriters have an over-allotment option to purchase additional securities from us, the underwriters may close out any covered short position by either exercising their over-allotment option or purchasing securities in the open market. In determining the source of securities to close out the covered short position, the underwriters may consider, among other things, the price of securities available for purchase in the open market as compared to the price at which they may purchase securities through the over-allotment option. Naked short sales are any sales in excess of such option or where the underwriters do not have an over-allotment option. The underwriters must close out any naked short position by purchasing securities in the open market. A naked short position is more likely to be created if the underwriters are concerned that there may be downward pressure on the price of the securities in the open market after pricing that could adversely affect investors who purchase in the offering.

Accordingly, to cover these short sales positions or to otherwise stabilize or maintain the price of the securities, the underwriters may bid for or purchase securities in the open market and may impose penalty bids. If penalty bids are imposed, selling concessions allowed to syndicate members or other broker-dealers participating in the offering are reclaimed if securities previously distributed in the offering are repurchased, whether in connection with stabilization transactions or otherwise. The effect of these transactions may be to stabilize or maintain the market price of the securities at a level above that which might otherwise prevail in the open market. The impositions of a penalty bid may also affect the price of the securities to the extent that it discourages resale of the securities. The magnitude or effect of any stabilization or other transactions is uncertain. These transactions may be effected on The NASDAQ Capital Market or otherwise and, if commenced, may be discontinued at any time.

To the extent required, this prospectus may be amended or supplemented from time to time to describe a specific plan of distribution.

Table of Contents

LEGAL MATTERS

The validity of the securities offered hereby is being passed upon for us by Cooley LLP, Boston, Massachusetts.

EXPERTS

Meaden & Moore, Ltd., independent registered public accounting firm, has audited our consolidated financial statements included in our Annual Report on Form 10-K for the year ended December 31, 2012, and the effectiveness of our internal control over financial reporting as of December 31, 2012, as set forth in their reports, which are incorporated by reference in this prospectus and elsewhere in the registration statement. Our financial statements and our management's assessment of the effectiveness of internal controls over financial reporting as of December 31, 2012 are incorporated by reference in reliance on Meaden & Moore, Ltd.'s reports, given on their authority as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We file reports, proxy statements and other documents with the SEC as required by the Exchange Act. You can find, copy and inspect information we file at the SEC's public reference room at 100 F Street, N.E., Washington, D.C. 20549. You can call the SEC at 1-800-SEC-0330 for further information about the public reference room. You can review our electronically filed reports, proxy and information statements on the SEC's web site at www.sec.gov or on our web site at www.cbiolabs.com. Information included on our web site is not part of this prospectus or any prospectus supplement.

This prospectus is part of a registration statement that we filed with the SEC. The registration statement contains more information than this prospectus regarding us and our securities, including exhibits and schedules. You can obtain a copy of the registration statement from the SEC at any address listed above or from the SEC's web site.

INCORPORATION OF CERTAIN DOCUMENTS BY REFERENCE

The SEC allows us to incorporate into this prospectus information that we file with the SEC in other documents. This means that we can disclose important information to you by referring to other documents that contain that information. Any information that we incorporate by reference is considered part of this prospectus.

Information contained in this prospectus and information that we file with the SEC in the future and incorporate by reference in this prospectus automatically modifies and supersedes previously filed information including information in previously filed documents or reports that have been incorporated by reference in this prospectus, to the extent the new information differs from or is inconsistent with the old information. Any information so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this prospectus.

We incorporate by reference, as of their respective dates of filing, the documents listed below that we have filed with the SEC and any documents that we file with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act after the date of this prospectus (except in each case the information contained in such documents to the extent furnished and not filed):

- (1) our Annual Report on Form 10-K for the year ended December 31, 2012, as filed with the SEC on March 18, 2013 and as amended on April 30, 2013 (File No. 001-32954);

- (2) our Quarterly Report on Form 10-Q for the quarter ended March 31, 2013, as filed with the SEC on May 9, 2013 (File No. 001-32954);

- (3) our Quarterly Report on Form 10-Q for the quarter ended June 30, 2013, as filed with the SEC on August 9, 2013 (File No. 001-32954);

- (4) our Quarterly Report on Form 10-Q for the quarter ended September 30, 2013, as filed with the SEC on November 8, 2013 (File No. 001-32954);

Table of Contents

- (5) our Current Reports on Form 8-K filed with the SEC on April 9, 2013, April 25, 2013, May 9, 2013, June 20, 2013, September 5, 2013, October 4, 2013, October 18, 2013 and November 6, 2013 (File No.001-32954);
- (6) any other filings pursuant to the Exchange Act after the date of filing the initial registration statement and prior to the termination of the offering; and
- (7) the description of our common stock contained in our registration statement on Form 8-A filed with the SEC on July 20, 2006, including any amendments or reports filed for the purpose of updating that description. You may request a copy of these documents, which will be provided to you at no cost, by writing or telephoning us using the following contact information:

Cleveland BioLabs, Inc.

73 High Street

Buffalo, New York 14203

Attention: Corporate Secretary

Telephone: (716) 849-6810

You should rely only on the information contained in this prospectus, including information incorporated by reference as described above, any accompanying prospectus supplement or any free writing prospectus we may authorize to be delivered to you. We have not authorized anyone to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it. You should not assume that the information in this prospectus or any prospectus supplement is accurate as of any date other than the date on the front of those documents or that any document incorporated by reference is accurate as of any date other than its filing date. You should not consider this prospectus to be an offer or solicitation relating to the securities in any jurisdiction in which such an offer or solicitation relating to the securities is not authorized. Furthermore, you should not consider this prospectus to be an offer or solicitation relating to the securities if the person making the offer or solicitation is not qualified to do so, or if it is unlawful for you to receive such an offer or solicitation.

Table of Contents

572,205 Shares of Common Stock

Pre-funded Warrants to Purchase 594,688 Shares of Common Stock

PROSPECTUS SUPPLEMENT

LADENBURG THALMANN

February 4, 2015