Filed Pursuant to Rule 424(b)(5)
Registration Statement No. 333-195122

PROSPECTUS SUPPLEMENT
(To prospectus dated April 22, 2014)

10,000,000 Shares

Common Stock

We are offering 10,000,000 shares of common stock, par value $0.00000002 per share. Our common stock is listed on the Nasdaq Capital Market under the symbol "MEIP." The last reported sale price of our common stock on the Nasdaq Capital Market on December 11, 2014 was $4.205 per share.

An investment in our common stock involves significant risks. You should carefully consider the risk factors beginning on page 15 of our Annual Report on Form 10-K filed with the Securities and Exchange Commission on September 9, 2014, and on page S-6 of this prospectus supplement before investing in our common stock.

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

	Per Share	Total
Public offering price	$4.00	$40,000,000
Underwriting discounts	$.24	$2,400,000
Proceeds, before expenses, to us	$3.76	$37,600,000

We have granted the underwriters an option exercisable for up to 30 days from the date of this prospectus supplement to purchase up to 1,500,000 additional shares of common stock at the public offering price less underwriting discounts. If this option were exercised in full, we would receive approximately $5,640,000 of additional proceeds, before expenses.

The underwriters expect to deliver the shares of common stock to the purchasers on or about December 17, 2014.

Sole Book-Running Manager

BofA Merrill Lynch

Co-Lead Managers

Cowen and Company **Stifel**

Co-Manager

Wedbush PacGrow Life Sciences

The date of this prospectus supplement is December 11, 2014.

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Prospectus Supplement

Prospectus

You should rely only on the information contained in or incorporated by reference into this prospectus supplement and the accompanying base prospectus and any free writing prospectuses prepared by us or on our behalf. We have not authorized any person to provide any information or make any statement that differs from what is contained in this prospectus supplement, the accompanying base prospectus and any free writing prospectuses prepared by us or on our behalf. If any person does make a statement that differs from what is in this prospectus supplement, the accompanying base prospectus or any free writing prospectuses, you should not rely on it. This prospectus supplement is not an offer to sell, nor is it a solicitation of an offer to buy, these securities in any jurisdiction in which the offer or sale is not permitted. You should assume that the information contained in this prospectus supplement, the accompanying base prospectus, any free writing prospectus and the documents incorporated by reference is accurate only as of their respective dates, regardless of the time of delivery of this prospectus supplement, the accompanying base prospectus, any free writing prospectus or of any sale of shares of our common stock in this offering. Our business, financial condition, results of operations and prospects may have subsequently changed.

ABOUT THIS PROSPECTUS SUPPLEMENT

This prospectus supplement and the accompanying base prospectus are part of a registration statement on Form S-3 that we filed with the Securities and Exchange Commission, or SEC, using a "shelf" registration statement. Under the shelf registration statement, we may offer and sell any combination of securities described in the accompanying base prospectus in one or more offerings. The accompanying base prospectus provides you with a general description of the securities we may offer. Each time we use the accompanying base prospectus to offer securities, we will provide a prospectus supplement that will contain specific information about the terms of that offering. The prospectus supplement may also add, update or change information contained in the accompanying base prospectus.

This prospectus supplement, the accompanying base prospectus and the documents incorporated by reference herein include important information about us, our common stock and other information you should know before investing. This prospectus supplement describes the specific details regarding this offering, including the price, the amount of common stock being offered and the risks of investing in our common stock. The accompanying base prospectus provides general information about us, some of which may not apply to this offering.

To the extent that any statement that we make in this prospectus supplement is inconsistent with statements made in the accompanying base prospectus, the statements made in this prospectus supplement will be deemed to modify or supersede those made in the accompanying base prospectus. You should read both this prospectus supplement and the accompanying base prospectus together with additional information described under the heading, "Where You Can Find More Information."

CAUTIONARY STATEMENT ABOUT FORWARD-LOOKING STATEMENTS

This prospectus supplement and the documents incorporated by reference herein include forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (the "Securities Act") and Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"). All statements other than statements of historical facts contained in this prospectus supplement and in the documents incorporated by reference herein, including statements regarding the future financial position, business strategy and plans and objectives of management for future operations, are forward-looking statements. The words "believe," "may," "will," "estimate," "continue," "anticipate," "intend," "should," "plan," "expect," and similar expressions, as they relate to us, are intended to identify forward-looking statements. We have based these forward-looking statements largely on current expectations and projections about future events and financial trends that we believe may affect our financial condition, results of operations, business strategy and financial needs. These forward-looking statements are subject to a number of risks, uncertainties and assumptions, including, without limitation, those described in "Risk Factors" in this prospectus supplement and in our Annual Report on Form 10-K for the fiscal year ended June 30, 2014, including, among other things:

- our inability to obtain required additional financing or financing available to us on acceptable terms, or at all, which may cause us to delay, scale-back or eliminate plans related to development of our drug candidates;
- we are in an early stage of clinical studies for our product candidates on which our development plans are based; clinical studies by their nature typically have a high level of risk and may not produce successful results;
- the results of pre-clinical studies and completed clinical trials are not necessarily predictive of future results, and our current drug candidates may not have favorable results in later studies or trials;
- our inability to maintain or enter into, and the risks resulting from our dependence upon, contractual arrangements necessary for the clinical development, manufacture, commercialization, marketing, sales and distribution of our product candidates;
- costs and delays in the clinical development programs and/or receipt of U.S. Food and Drug Administration (the "FDA") or other required governmental approvals, or the failure to obtain such approvals, for our product candidates;
- the FDA's interpretation and our interpretation of data from preclinical and clinical studies may differ significantly;
- our failure to successfully commercialize our product candidates;
- the failure of any products to gain market acceptance;
- our inability to control the costs of manufacturing our products;
- competition and competitive factors;
- our inability to protect our patents or proprietary rights and obtain necessary rights to third party patents and intellectual property to operate our business;
- our inability to operate our business without infringing the patents and proprietary rights of others;

- costs stemming from our defense against third party intellectual property infringement claims;
- general economic conditions;
- technological changes;
- government regulation generally and the receipt of regulatory approvals;
- changes in industry practice; and
- one-time events.

These risks are not exhaustive. Other sections of this prospectus supplement and the documents incorporated by reference herein include additional factors which could adversely impact our business and financial performance. Moreover, we operate in a very competitive and rapidly changing environment. New risk factors emerge from time to time and it is not possible for us to predict all risk factors, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements.

You should not rely upon forward looking statements as predictions of future events. We cannot assure you that the events and circumstances reflected in the forward looking statements will be achieved or occur. Although we believe that the expectations reflected in the forward looking statements are reasonable, we cannot guarantee future results, levels of activity, performance or achievements.

SUMMARY

This summary highlights selected information appearing elsewhere or incorporated by reference in this prospectus supplement and accompanying prospectus and may not contain all of the information that is important to you. This prospectus supplement and the accompanying prospectus include or incorporate by reference information about the shares we are offering as well as information regarding our business and detailed financial data. You should read this prospectus supplement and the accompanying prospectus in their entirety, including the information incorporated by reference.

The Company

We are an oncology company focused on the clinical development of novel therapies for cancer. Our common stock is listed on the Nasdaq Capital Market under the symbol "MEIP".

Our business purpose is the development of drugs for the treatment of cancer. We are principally focused on the clinical development of our lead drug candidate, Pracinostat, which we are currently investigating in Phase II clinical trials. Pracinostat is an orally available histone deacetylase (HDAC) inhibitor that is currently being developed for advanced hematologic diseases such as myelodysplastic syndrome (MDS) and acute myeloid leukemia (AML). In August 2012, we completed the acquisition of certain assets and intellectual property, including those related to Pracinostat, from S*Bio Pte Ltd ("S*Bio"). Our clinical development pipeline also includes our isoflavone-based mitochondrial inhibitor drug candidate, ME-344. Results from a Phase I clinical trial of ME-344 in patients with refractory solid tumors were presented in October 2013. A Phase Ib trial in patients with small cell lung cancer and ovarian cancer is ongoing. In September 2013, we acquired PWT143, an oral inhibitor of phosphatidylinositide 3-kinase (PI3K) delta, a molecular target that has been shown to play a critical role in the proliferation and survival of hematologic cancer cells. We have completed the pre-clinical work required to seek approval for first-in-human studies of PWT143, which we expect to initiate during the first half of calendar 2015.

We own exclusive worldwide rights to all of our drug candidates, including Pracinostat, ME-344 and PWT143.

As of September 30, 2014, we had $42.1 million in cash, cash equivalents and short-term investments. In order to continue the development of our lead drug candidates, at some point in the future we may pursue one or more additional capital raising transactions, whether through the sale of equity securities or the entry into strategic partnerships.

Clinical Product Development Programs

Lead Drug Candidate: Pracinostat

We are principally focused on the clinical development of our lead drug candidate, Pracinostat. Pracinostat is an orally available inhibitor of a group of enzymes called histone deacetylases, or HDACs. HDACs belong to a larger set of proteins collectively known as epigenetic regulators that can alter gene expression by chemically modifying DNA or its associated chromosomal proteins. Abnormal activity of these regulators is believed to play an important role in cancer and other diseases.

Pracinostat has been tested in multiple Phase I and Phase II clinical trials in advanced hematologic malignancies, such as MDS, AML and myelofibrosis, as well as in solid tumor indications in both adult and pediatric patients. Pracinostat has been generally well tolerated in more than 300 patients to date, with manageable side effects often associated with drugs of this class, the most frequent of which is fatigue. The

results of these studies also suggest that Pracinostat has potential best-in-class pharmacokinetic properties when compared to other oral HDAC inhibitors, either approved or in development.

Pracinostat has demonstrated clinical evidence of single-agent activity in patients with AML and myelofibrosis. In a Phase I dose-escalation trial in patients with advanced hematologic malignancies, 14% of evaluable patients (two out of 14) achieved a complete response (CR), with the responses enduring for more than 206 and 362 days, respectively. These results were presented at the American Society of Hematology (ASH) Annual Meeting in December 2010. In a Phase II clinical trial in intermediate or high-risk myelofibrosis, 36% of patients (eight of 22) demonstrated clinical response from Pracinostat treatment, with 9% of patients (two out of 22) having a clinical improvement (anemia response) and 27% (six of 22) experiencing some reduction in splenomegaly. These results were published in the September 2012 issue of Leukemia Research.

Pracinostat has also shown evidence of synergistic activity when used in combination with the hypomethylating agent, azacitidine (marketed as Vidaza®), in patients with advanced MDS. Results from a pilot Phase II trial presented at the ASH Annual Meeting in December 2012 showed an overall response rate of 89% (eight out of nine) among the nine patients treated at the MD Anderson Cancer Center, including seven patients who achieved either a CR or a complete response with incomplete blood count recovery (CRi). An additional patient treated at the University of Wisconsin-Madison achieved a CR, increasing the overall response rate in the trial to 90% (nine out of 10). The combination of Pracinostat and azacitidine was well tolerated in the study; the most frequent side effects were nausea and fatigue.

In August 2014, enrollment was completed in a randomized, double-blind, placebo-controlled Phase II clinical trial of Pracinostat in combination with azacitidine in intermediate-2 or high-risk patients with previously untreated MDS. The trial enrolled 102 evaluable patients with a one-to-one randomization. We expect to unblind this study after a six month follow-up period and report topline data in March 2015. The primary endpoint of the study is CR. Secondary endpoints include overall response rate, hematologic improvement, duration of response, progression-free survival, rate of leukemic transformation, overall survival and safety. The trial is being conducted at 24 sites in the U.S.

In addition, an open-label Phase II study of Pracinostat in combination with azacitidine or decitabine (marketed as Dacogen®) in patients with MDS who either failed to respond or maintain a response to their hypomethylating agent alone is ongoing.

In December 2014, enrollment was completed in an open-label Phase II study of Pracinostat in combination with azacitidine in elderly patients with newly diagnosed AML. The study enrolled a total of 50 patients at 15 clinical sites in the U.S.

Interim data from 33 patients evaluable for efficacy was presented at the ASH Annual Meeting in December 2014, as described under "—Recent Developments." As reported in an abstract of the presentation, submitted in August 2014, three of the first 14 patients evaluable for efficacy in the study achieved a CR and five achieved a CRi. Notably, all eight of these patients have improved to CR and none have progressed to date.

The combination of Pracinostat and azacitidine has been generally well-tolerated in the study, with no unexpected toxicities. The most common treatment emergent adverse events are neutropenia/neutropenic fever, thrombocytopenia, nausea, fatigue and anemia.

In February 2014, the FDA granted orphan drug designation to Pracinostat for the treatment of AML. The Company also intends to seek orphan drug designation to Pracinostat in combination with azacitidine for the treatment of AML. The designation provides orphan status to drugs defined by the FDA as those intended for the safe and effective treatment, diagnosis or prevention of rare diseases that affect fewer than 200,000 people in the

U.S. Orphan designation qualifies us for certain development incentives, including tax credits for qualified clinical testing, prescription drug user fee exemptions and seven-year marketing exclusivity upon FDA approval.

Mitochondrial Inhibitor Drug Candidate: ME-344

ME-344 is our isoflavone-derived mitochondrial inhibitor drug candidate. In pre-clinical studies, ME-344 has been shown to cause cell death in multiple human tumor cell lines, including ovarian cancer stem cells, by interfering with mitochondrial energy generation. In April 2013, Dr. Ayesha Alvero, Yale University School of Medicine, presented data at the American Association for Cancer Research (AACR) Annual Meeting showing the ability of ME-344 to decrease tumor burden and delay recurrence in a pre-clinical *in vivo* model of recurrent epithelial ovarian cancer, the most lethal of all gynecological malignancies.

In October 2013, results from our first-in-human, single-agent Phase I clinical trial of ME-344 in patients with refractory solid tumors were presented at the AACR-NCI-EORTC International Conference on Molecular Targets and Cancer Therapeutics. The results indicated that eight of 21 evaluable patients (38%) treated with ME-344 achieved stable disease or better, including five who experienced progression-free survival that was at least twice the duration of their last prior treatment before entry into the study. In addition, one of these patients, a heavily pre-treated patient with small cell lung cancer, achieved a confirmed partial response and continued weekly dosing for two years. ME-344 was generally well tolerated at doses equal to or less than 10 mg/kg delivered on a weekly schedule for extended durations. Dose limiting toxicities were observed at both the 15 mg/kg and 20 mg/kg dose levels, consisting primarily of Grade 3 peripheral neuropathy.

In May 2014, we initiated a Phase Ib clinical trial of ME-344 in combination with topotecan (trade name Hycamtin®) in patients with solid tumors. The Phase Ib study is evaluating the safety and tolerability of intravenous ME-344 in combination with topotecan, a chemotherapy approved by the FDA for the treatment of small cell lung, ovarian and cervical cancers. In October 2014, the first patient was dosed in the cohort-expansion stage of the study. The cohort expansion comes after the initial stage of the study confirmed that the maximum tolerated dose (MTD) of ME-344 in combination with topotecan is 10 mg/kg, the same dose defined for single-agent use. We plan to enroll an additional 40 patients into two cohorts: locally advanced or metastatic small cell lung cancer and ovarian cancer.

PI3-Kinase Delta Drug Candidate: PWT143

In September 2013, we acquired exclusive worldwide rights to PWT143 from Pathway Therapeutics, Inc. for an undisclosed upfront cash payment with no future milestone or royalty obligations. In pre-clinical studies, PWT143 has been found to be a potent and selective oral inhibitor of PI3-kinase delta, a molecular target that has been shown to play a critical role in the proliferation and survival of certain hematologic cancer cells. We have completed the required pre-clinical work required to seek approval for first-in-human studies of PWT143.

Recent Developments

At the ASH Annual Meeting on December 6, 2014, we presented interim data from 33 patients evaluable for efficacy in our open-label Phase II study of Pracinostat in combination with azacitidine in elderly patients with newly diagnosed AML. We reported that, to date, 45% of patients (15 out of 33) evaluable for efficacy in the study achieved the primary endpoint of the study, including nine who achieved a CR, four who achieved a CRi and two who achieved a morphologic leukemia-free state (MLFS). No patient who achieved a CR has progressed to date. The combination of Pracinostat and azacitidine has been generally well-tolerated in the study, with no unexpected toxicities, with six subjects discontinued due to treatment-emergent adverse events.

Based on these interim data and recent discussions with the U.S. Food and Drug Administration, we are now actively preparing for a Phase III registration study using CR as the primary endpoint to support accelerated

approval for this indication and overall survival as the endpoint for full approval. Meanwhile, we expect to unblind our randomized, placebo-controlled Phase II study of Pracinostat and azacitidine in front line myelodysplastic syndrome and report top line data in March 2015.

Corporate Information

Our principal executive offices are located at 11975 El Camino Real, Suite 101, San Diego, California, 92130, and our phone number is (858) 792-6300. Our website is located at www.meipharma.com. Information on or accessible through our website is not part of, or incorporated by reference into, this prospectus supplement, other than documents filed with the SEC that we incorporate by reference.

THE OFFERING

Common stock offered by us pursuant to this prospectus supplement	10,000,000 shares of common stock
Common stock outstanding after the offering (assuming no exercise of the underwriters' option to purchase additional shares)	31,791,247 shares (1)
Option to purchase additional shares	We have granted the underwriters an option to purchase up to 1,500,000 additional shares of our common stock. This option is exercisable, in whole or in part, for a period of 30 days from the date of this prospectus supplement.
Use of proceeds	We intend to use a portion of the net proceeds from this offering, together with other available funds, to progress the clinical development program for Pracinostat in AML and for other general corporate purposes. See "Use of Proceeds" on page S-9.
Nasdaq Capital Market symbol	"MEIP"
Risk factors	This investment involves a high degree of risk. See "Risk Factors" beginning on page S-6 of this prospectus supplement, the risk factors beginning on page 15 of our Annual Report on Form 10-K as filed with the Securities and Exchange Commission on September 9, 2014, as well as the other information included in or incorporated by reference in this prospectus supplement and the accompanying prospectus for a discussion of risks you should consider carefully before making an investment decision.

(1) Based on 21,791,247 shares of common stock outstanding as of December 3, 2014. Excludes (i) 1,843,572 shares of our common stock subject to outstanding options, with exercise prices ranging from $2.76 to $30.30 per share, (ii) 400,000 restricted stock units, each representing the contingent right to receive one share of our common stock, (iii) 4,597,370 shares of our common stock subject to outstanding warrants, with exercise prices ranging from $3.12 to $7.14 per share, (iv) based on an assumed price per share of $5.99, which was the last reported sale price of our common stock on the Nasdaq Capital Market on December 9, 2014, up to 83,473 shares of common stock that may be issuable upon our achievement of certain clinical and regulatory milestones pursuant to the terms of the August 2012 Asset Purchase Agreement between the Company and S*Bio, and (v) 1,758,762 shares of our common stock available for awards under our Amended and Restated 2008 Stock Omnibus Equity Compensation Plan, in each case as of December 3, 2014.

Unless otherwise stated, all information contained in this prospectus supplement assumes no exercise of the underwriters' option to purchase up to 1,500,000 additional shares.

RISK FACTORS

Any investment in our common stock involves a high degree of risk. In addition to the other information included or incorporated by reference in this prospectus supplement and the accompanying prospectus, you should carefully consider the important factors set forth under the heading "Risk Factors" starting on page 15 of our Annual Report on Form 10-K for the fiscal year ended June 30, 2014 and incorporated herein by reference before investing in our common stock. For further details, see the sections entitled "Where You Can Find More Information" and "Incorporation of Certain Documents by Reference" in this prospectus supplement.

Any of the risk factors set forth below or referred to above could significantly and negatively affect our business, results of operations or financial condition, which may lower the trading price of our common stock. The risks referred to above are not the only ones that may exist. Additional risks not currently known by us or that we deem immaterial may also impair our business operations. You may lose all or a part of your investment.

Risks Related to Securities Markets and Investment in our Stock

The trading price of the shares of our common stock has been and may continue to be highly volatile and could decline in value and we may incur significant costs from class action litigation.

The trading price of our common stock could be highly volatile in response to various factors, many of which are beyond our control, including:

- failure to successfully develop our drug candidates, including our lead drug candidate Pracinostat;
- announcements of technological innovations by us or our competitors;
- new products introduced or announced by us or our competitors;
- changes in financial estimates by securities analysts;
- actual or anticipated variations in operating results;
- expiration or termination of licenses research contracts or other collaboration agreements;
- conditions or trends in the regulatory climate and the biotechnology, pharmaceutical and genomics industries;
- instability in the stock market as a result of current global events;
- changes in the market valuations of similar companies;
- the liquidity of any market for our securities;
- additional sales by us of shares of our common stock; and
- threatened or actual delisting of our common stock from a national stock exchange.

Equity markets in general, and the market for biotechnology and life sciences companies in particular, have experienced substantial price and volume fluctuations that have often been unrelated or disproportionate to the operating performance of companies traded in those markets. In addition, changes in economic conditions in the U.S., Europe or globally, particularly in the context of current global events, could impact upon our ability to grow profitably. Adverse economic changes are outside our control and may result in material adverse impacts on our business or our results of operations. These broad market and industry factors may materially affect the

market price of shares of our common stock, regardless of our development and operating performance. In the past, following periods of volatility in the market price of a company's securities, securities class-action litigation has often been instituted against that company. Such litigation, if instituted against us, could cause us to incur substantial costs and divert management's attention and resources.

Future sales, including sales by our executive officers or directors, or other issuances of our common stock could depress the market for our common stock.

Sales of a substantial number of shares of our common stock, including sales by our executive officers or directors, or the perception by the market that those sales could occur, could cause the market price of our common stock to decline or could make it more difficult for us to raise funds through the sale of equity in the future.

In connection with this offering, we have entered into a lock-up agreement for a period of 90 days following this offering and our directors and officers have entered into lock-up agreements for a period of 90 days following this offering (which periods may be extended under certain circumstances). We and our directors and officers may be released from the lock-up prior to the expiration of the lock-up period at the sole discretion of Merrill Lynch, Pierce, Fenner & Smith Incorporated, as representative of the underwriters. See "Underwriting." Upon expiration or earlier release of the lock-up, we and our directors and officers may sell shares into the market, either as part, or outside, of trading plans under SEC Rule 10b5-1, which could adversely affect the market price of shares of our common stock.

Future issuances of common stock could further depress the market for our common stock.

Investors in this offering will experience immediate and substantial dilution and may experience further dilution in the future.

The public offering price of the common stock offered pursuant to this prospectus supplement is substantially higher than the net tangible book value per share of our common stock. Therefore, if you purchase shares of common stock in this offering, you will incur immediate and substantial dilution in the pro forma net tangible book value per share of common stock from the price per share that you pay for the common stock. See the section entitled "Dilution" below for a more detailed discussion of the dilution you will incur if you purchase shares in this offering. Furthermore, we expect that we will seek to raise additional capital from time to time in the future. Such financings may involve the issuance of equity and/or securities convertible into or exercisable or exchangeable for our equity securities. We also expect to continue to utilize equity-based compensation. To the extent the warrants and options are exercised or we issue common stock, preferred stock, or securities such as warrants that are convertible into, exercisable or exchangeable for, our common stock or preferred stock in the future, you may experience further dilution.

We will have broad discretion over the use of the net proceeds from this offering.

We will have broad discretion to use the net proceeds from the sale of common stock in this offering, and investors in our stock will be relying on the judgment of our board of directors and management regarding the application of these proceeds. Although we expect to use a substantial portion of the net proceeds from this offering for general corporate purposes and the progression of our clinical trial program, we have not allocated these net proceeds for specific purposes.

Because we do not intend to pay, and have not paid, any cash dividends on our shares of common stock, our stockholders will not be able to receive a return on their shares unless the value of our common stock appreciates and they sell their shares.

We have never paid or declared any cash dividends on our common stock, and we intend to retain any future earnings to finance the development and expansion of our business. We do not anticipate paying any cash dividends on our common stock in the foreseeable future. Therefore, our stockholders will not be able to receive a return on their investment unless the value of our common stock appreciates and they sell their shares.

We are authorized to issue blank check preferred stock, which could adversely affect the holders of our common stock.

Our restated certificate of incorporation allows us to issue blank check preferred stock with rights potentially senior to those of our common stock without any further vote or action by the holders of our common stock. The issuance of a class of preferred stock could decrease the amount of earnings and assets available for distribution to the holders of our common stock or could adversely affect the rights and powers, including voting rights, of such holders. In certain circumstances, such issuance could have the effect of decreasing the market price of our shares, or making a change in control of us more difficult.

USE OF PROCEEDS

We estimate that the net proceeds from our sale of 10,000,000 shares of our common stock in this offering will be approximately $37.4 million (or approximately $43.0 million if the underwriters' option to purchase additional shares is exercised in full), after deducting underwriting discounts and commissions and estimated offering expenses payable by us.

We intend to use a portion of the net proceeds from this offering, together with other available funds, to progress the clinical development programs for Pracinostat in AML and for other general corporate purposes.

We have not specifically identified the precise amounts we will spend on particular areas or the timing of these expenditures. The amounts actually expended for each purpose may vary significantly depending upon numerous factors, including the amount and timing of the proceeds from this offering, the progress of our clinical trials and other product development activities. In addition, expenditures may also depend on the establishment of new collaborative arrangements with other partners, the availability of other financing and other factors.

We anticipate that we will be required to raise substantial additional capital to continue to fund the clinical development of our drug candidates. We expect to seek to raise additional capital through additional public or private financings, principally through equity issuances.

MARKET PRICE AND DIVIDEND INFORMATION

Our common stock is currently listed on the Nasdaq Capital Market under the symbol “MEIP.” As of December 3, 2014, we had 21,791,247 shares of our common stock outstanding, held by approximately 3,053 holders of record.

The following table sets forth the quarterly high and low sales prices of our common stock on the Nasdaq Capital Market, for the periods indicated, after adjustment of all amounts to retroactively reflect the 1-for-6 reverse stock split that occurred on December 18, 2012:

	Share Prices	
	High	Low
Year Ending June 30, 2015		
First Quarter	$ 7.56	$5.89
Second Quarter (through December 11, 2014)	$ 8.33	$4.11
Year Ended June 30, 2014		
First Quarter	$12.45	$6.52
Second Quarter	$11.31	$7.30
Third Quarter	$13.98	$7.71
Fourth Quarter	$11.50	$5.51
Year Ended June 30, 2013		
First Quarter	$ 4.80	$1.98
Second Quarter	$13.18	$2.10
Third Quarter	$ 9.65	$4.37
Fourth Quarter	$ 9.40	$6.89

We have never paid or declared any cash dividends on our common stock, and we intend to retain any future earnings to finance the development and expansion of our business. We do not anticipate paying any cash dividends on our common stock in the foreseeable future.

DILUTION

Our net tangible book value as of September 30, 2014 was approximately $37.2 million, or $1.72 per share of common stock. Net tangible book value per share is equal to our total tangible assets minus total liabilities, all divided by the number of shares of common stock outstanding. After giving effect to the sale by us of shares of our common stock offered by this prospectus supplement at a public offering price of $4.00 per share, and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us, our adjusted net tangible book value as of September 30, 2014 would have been $74.6 million, or $2.36 per share of common stock. This represents an immediate increase in net tangible book value of approximately $0.64 per share to existing stockholders and an immediate dilution of approximately $1.64 per share to new investors purchasing our common stock in this offering. The following table illustrates this calculation on a per share basis:

Public offering price for one share of common stock		$4.00
Net tangible book value per share as of September 30, 2014	$1.72	
Increase per share attributable to new investors in this offering	$.64	
As-adjusted net tangible book value per share as of September 30, 2014, after giving effect to this offering		$2.36
Dilution per share to new investors in this offering		$1.64

The information above assumes that the underwriters do not exercise their option to purchase additional shares. If the underwriters exercise their option in full, our as-adjusted net tangible book value per share at September 30, 2014 after giving effect to this offering would have been $2.42 per share, and the dilution in as-adjusted net tangible book value per share to investors in this offering would have been $1.58 per share.

The number of shares of common stock shown above to be outstanding after this offering is based on 21,607,296 shares outstanding as of September 30, 2014 and excludes 183,951 additional shares outstanding as of the date hereof and the following shares underlying outstanding securities convertible or exercisable for shares of common stock as of the date hereof:

- the remaining warrants issued in the May 2012 rights offering exercisable to purchase 315,484 shares of our common stock at an exercise price of $7.14 per share;
- the remaining warrants issued in the December 2012 private placement exercisable to purchase 4,066,165 shares of our common stock at an exercise price of $3.12 per share;
- the remaining Series A warrants issued in the May 2011 private placement exercisable to purchase 215,721 shares of our common stock at an exercise price of $6.00 per share;
- options to purchase 1,843,572 shares of common stock at exercise prices from $2.76 to $30.30 per share, which expire at various dates in calendar years 2014, 2015, 2016, 2017, 2018 and 2019; and
- based on an assumed price per share of $5.99, which was the last reported sale price of our common stock on the Nasdaq Capital Market on December 9, 2014, up to 83,473 shares of common stock that may be issuable upon our achievement of certain clinical and regulatory milestones pursuant to the terms of the August 2012 Asset Purchase Agreement between the Company and S*Bio.

To the extent outstanding warrants or options are exercised, there will be further dilution to new investors. In addition, to the extent we issue additional equity securities in connection with future capital raising activities, our then-existing stockholders may experience dilution.

UNDERWRITING

Merrill Lynch, Pierce, Fenner & Smith Incorporated is acting as representative of each of the underwriters named below. Subject to the terms and conditions set forth in an underwriting agreement among us and the underwriters, we have agreed to sell to the underwriters, and each of the underwriters has agreed, severally and not jointly, to purchase from us, the number of shares of common stock set forth opposite its name below.

Underwriter	Number of Shares
Merrill Lynch, Pierce, Fenner & Smith Incorporated	5,500,000
Cowen and Company, LLC	1,850,000
Stifel, Nicolaus & Company, Incorporated	1,850,000
Wedbush Securities Inc.	800,000
Total	10,000,000

Subject to the terms and conditions set forth in the underwriting agreement, the underwriters have agreed, severally and not jointly, to purchase all of the shares sold under the underwriting agreement if any of these shares are purchased. If an underwriter defaults, the underwriting agreement provides that the purchase commitments of the nondefaulting underwriters may be increased or the underwriting agreement may be terminated.

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

The underwriters are offering the shares, subject to prior sale, when, as and if issued to and accepted by them, subject to approval of legal matters by their counsel, including the validity of the shares, and other conditions contained in the underwriting agreement, such as the receipt by the underwriters of officer's certificates and legal opinions. The underwriters reserve the right to withdraw, cancel or modify offers to the public and to reject orders in whole or in part.

Commissions and Discounts

The representative has advised us that the underwriters propose initially to offer the shares to the public at the public offering price set forth on the cover page of this prospectus and to dealers at that price less a concession not in excess of $0.14 per share. After the initial offering, the public offering price, concession or any other term of the offering may be changed.

The following table shows the public offering price, underwriting discount and proceeds before expenses to us. The information assumes either no exercise or full exercise by the underwriters of their option to purchase 1,500,000 additional shares.

	Per Share	Without Option	With Option
Public offering price	$4.00	$40,000,000	$46,000,000
Underwriting discount	$.24	$2,400,000	$2,760,000
Proceeds, before expenses, to us	$3.76	$37,600,000	$43,240,000

The expenses of the offering, not including the underwriting discount, are estimated at $200,000 and are payable by us.

Roth Capital Partners, LLC, ("Roth"), a FINRA member, acted as financial advisor for us in connection with this offering. Roth is neither acting as an underwriter in this offering nor obligated to purchase any shares in this offering. We have agreed to pay a fee of $25,000 to Roth for advisory services provided to us in connection with this offering.

Option to Purchase Additional Shares

We have granted an option to the underwriters, exercisable for 30 days after the date of this prospectus, to purchase up to 1,500,000 additional shares at the public offering price, less the underwriting discount. If the underwriters exercise this option, each will be obligated, subject to conditions contained in the underwriting agreement, to purchase a number of additional shares proportionate to that underwriter's initial amount reflected in the above table.

No Sales of Similar Securities

We, our executive officers and directors have agreed not to sell or transfer any common stock or securities convertible into, exchangeable for, exercisable for, or repayable with common stock, for 90 days after the date of this prospectus without first obtaining the written consent of Merrill Lynch, Pierce, Fenner & Smith Incorporated. Specifically, we and these other persons have agreed, with certain limited exceptions, not to directly or indirectly:

- offer, pledge, sell or contract to sell any common stock,
- sell any option or contract to purchase any common stock,
- purchase any option or contract to sell any common stock,
- grant any option, right or warrant for the sale of any common stock,
- lend or otherwise dispose of or transfer any common stock,
- request or demand that we file a registration statement related to the common stock, or
- enter into any swap or other agreement that transfers, in whole or in part, the economic consequence of ownership of any common stock whether any such swap or transaction is to be settled by delivery of shares or other securities, in cash or otherwise.

This lock-up provision applies to common stock and to securities convertible into or exchangeable or exercisable for or repayable with common stock. It also applies to common stock owned now or acquired later by the person executing the agreement or for which the person executing the agreement later acquires the power of disposition. In the event that either (x) during the last 17 days of the lock-up period referred to above, we issue an earnings release or material news or a material event relating to the Company occurs or (y) prior to the expiration of the lock-up period, we announce that we will release earnings results or become aware that material news or a material event will occur during the 16-day period beginning on the last day of the lock-up period, the restrictions described above shall continue to apply until the expiration of the 18-day period beginning on the issuance of the earnings release or the occurrence of the material news or material event.

Nasdaq Capital Market Listing

The shares are listed on the Nasdaq Capital Market under the symbol "MEIP."

Price Stabilization, Short Positions

Until the distribution of the shares is completed, SEC rules may limit underwriters and selling group members from bidding for and purchasing our common stock. However, the representative may engage in transactions that stabilize the price of the common stock, such as bids or purchases to peg, fix or maintain that price.

In connection with the offering, the underwriters may purchase and sell our common stock in the open market. These transactions may include short sales, purchases on the open market to cover positions created by short sales and stabilizing transactions. Short sales involve the sale by the underwriters of a greater number of shares 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 shares described above. The underwriters may close out any covered short position by either exercising their option to purchase additional shares or purchasing shares in the open market. In determining the source of shares to close out the covered short position, the underwriters will consider, among other things, the price of shares available for purchase in the open market as compared to the price at which they may purchase shares through the option granted to them. “Naked” short sales are sales in excess of such option. The underwriters must close out any naked short position by purchasing shares 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 our common stock in the open market after pricing that could adversely affect investors who purchase in the offering. Stabilizing transactions consist of various bids for or purchases of shares of common stock made by the underwriters in the open market prior to the completion of the offering.

Similar to other purchase transactions, the underwriters’ purchases to cover the syndicate short sales may have the effect of raising or maintaining the market price of our common stock or preventing or retarding a decline in the market price of our common stock. As a result, the price of our common stock may be higher than the price that might otherwise exist in the open market. The underwriters may conduct these transactions on Nasdaq Capital Market, in the over-the-counter market or otherwise.

Neither we nor any of the underwriters make any representation or prediction as to the direction or magnitude of any effect that the transactions described above may have on the price of our common stock. In addition, neither we nor any of the underwriters make any representation that the representative will engage in these transactions or that these transactions, once commenced, will not be discontinued without notice.

Passive Market Making

In connection with this offering, underwriters and selling group members may engage in passive market making transactions in the common stock on the Nasdaq Global Market in accordance with Rule 103 of Regulation M under the Exchange Act during a period before the commencement of offers or sales of common stock and extending through the completion of distribution. A passive market maker must display its bid at a price not in excess of the highest independent bid of that security. However, if all independent bids are lowered below the passive market maker’s bid, that bid must then be lowered when specified purchase limits are exceeded. Passive market making may cause the price of our common stock to be higher than the price that otherwise would exist in the open market in the absence of those transactions. The underwriters and dealers are not required to engage in passive market making and may end passive market making activities at any time.

Electronic Distribution

In connection with the offering, certain of the underwriters or securities dealers may distribute prospectuses by electronic means, such as e-mail.

Other Relationships

Some of the underwriters and their affiliates have engaged in, and may in the future engage in, investment banking and other commercial dealings in the ordinary course of business with us or our affiliates. They have received, or may in the future receive, customary fees and commissions for these transactions.

In addition, in the ordinary course of their business activities, the underwriters and their affiliates may make or hold a broad array of investments and actively trade debt and equity securities (or related derivative securities) and financial instruments (including bank loans) for their own account and for the accounts of their customers. Such investments and securities activities may involve securities and/or instruments of ours or our affiliates. The underwriters and their affiliates may also make investment recommendations and/or publish or express independent research views in respect of such securities or financial instruments and may hold, or recommend to clients that they acquire, long and/or short positions in such securities and instruments.

Notice to Prospective Investors in the European Economic Area

In relation to each Member State of the European Economic Area (each, a "Relevant Member State"), no offer of shares may be made to the public in that Relevant Member State other than:

A. to any legal entity which is a qualified investor as defined in the Prospectus Directive;

B. to fewer than 100 or, if the Relevant Member State has implemented the relevant provision of the 2010 PD Amending Directive, 150, natural or legal persons (other than qualified investors as defined in the Prospectus Directive), as permitted under the Prospectus Directive, subject to obtaining the prior consent of the representative; or

C. in any other circumstances falling within Article 3(2) of the Prospectus Directive,

provided that no such offer of shares shall require the Company or the representative to publish a prospectus pursuant to Article 3 of the Prospectus Directive or supplement a prospectus pursuant to Article 16 of the Prospectus Directive.

Each person in a Relevant Member State who initially acquires any shares or to whom any offer is made will be deemed to have represented, acknowledged and agreed that it is a "qualified investor" within the meaning of the law in that Relevant Member State implementing Article 2(1)(e) of the Prospectus Directive. In the case of any shares being offered to a financial intermediary as that term is used in Article 3(2) of the Prospectus Directive, each such financial intermediary will be deemed to have represented, acknowledged and agreed that the shares acquired by it in the offer have not been acquired on a non-discretionary basis on behalf of, nor have they been acquired with a view to their offer or resale to, persons in circumstances which may give rise to an offer of any shares to the public other than their offer or resale in a Relevant Member State to qualified investors as so defined or in circumstances in which the prior consent of the representative has been obtained to each such proposed offer or resale.

The Company, the representative and their affiliates will rely upon the truth and accuracy of the foregoing representations, acknowledgements and agreements.

This prospectus has been prepared on the basis that any offer of shares in any Relevant Member State will be made pursuant to an exemption under the Prospectus Directive from the requirement to publish a prospectus for offers of shares. Accordingly any person making or intending to make an offer in that Relevant Member State of shares which are the subject of the offering contemplated in this prospectus may only do so in circumstances in which no obligation arises for the Company or any of the underwriters to publish a prospectus pursuant to Article 3 of the Prospectus Directive in relation to such offer. Neither the Company nor the underwriters have authorized, nor do they authorize, the making of any offer of shares in circumstances in which an obligation arises for the Company or the underwriters to publish a prospectus for such offer.

For the purpose of the above provisions, the expression "an offer to the public" in relation to any shares in any Relevant Member State means the communication in any form and by any means of sufficient information

on the terms of the offer and the shares to be offered so as to enable an investor to decide to purchase or subscribe the shares, as the same may be varied in the Relevant Member State by any measure implementing the Prospectus Directive in the Relevant Member State and the expression "Prospectus Directive" means Directive 2003/71/EC (including the 2010 PD Amending Directive, to the extent implemented in the Relevant Member States) and includes any relevant implementing measure in the Relevant Member State and the expression "2010 PD Amending Directive" means Directive 2010/73/EU.

Notice to Prospective Investors in the United Kingdom

In addition, in the United Kingdom, this document is being distributed only to, and is directed only at, and any offer subsequently made may only be directed at persons who are "qualified investors" (as defined in the Prospectus Directive) (i) who have professional experience in matters relating to investments falling within Article 19 (5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005, as amended (the "Order") and/or (ii) who are high net worth companies (or persons to whom it may otherwise be lawfully communicated) falling within Article 49(2)(a) to (d) of the Order (all such persons together being referred to as "relevant persons"). This document must not be acted on or relied on in the United Kingdom by persons who are not relevant persons. In the United Kingdom, any investment or investment activity to which this document relates is only available to, and will be engaged in with, relevant persons.

Notice to Prospective Investors in Switzerland

The shares may not be publicly offered in Switzerland and will not be listed on the SIX Swiss Exchange ("SIX") or on any other stock exchange or regulated trading facility in Switzerland. This document has been prepared without regard to the disclosure standards for issuance prospectuses under art. 652a or art. 1156 of the Swiss Code of Obligations or the disclosure standards for listing prospectuses under art. 27 ff. of the SIX Listing Rules or the listing rules of any other stock exchange or regulated trading facility in Switzerland. Neither this document nor any other offering or marketing material relating to the shares or the offering may be publicly distributed or otherwise made publicly available in Switzerland.

Neither this document nor any other offering or marketing material relating to the offering, the Company, the shares have been or will be filed with or approved by any Swiss regulatory authority. In particular, this document will not be filed with, and the offer of shares will not be supervised by, the Swiss Financial Market Supervisory Authority FINMA (FINMA), and the offer of shares has not been and will not be authorized under the Swiss Federal Act on Collective Investment Schemes ("CISA"). The investor protection afforded to acquirers of interests in collective investment schemes under the CISA does not extend to acquirers of shares.

Notice to Prospective Investors in the Dubai International Financial Centre

This prospectus supplement relates to an Exempt Offer in accordance with the Offered Securities Rules of the Dubai Financial Services Authority ("DFSA"). This prospectus supplement is intended for distribution only to persons of a type specified in the Offered Securities Rules of the DFSA. It must not be delivered to, or relied on by, any other person. The DFSA has no responsibility for reviewing or verifying any documents in connection with Exempt Offers. The DFSA has not approved this prospectus supplement nor taken steps to verify the information set forth herein and has no responsibility for the prospectus supplement. The shares to which this prospectus supplement relates may be illiquid and/or subject to restrictions on their resale. Prospective purchasers of the shares offered should conduct their own due diligence on the shares. If you do not understand the contents of this prospectus supplement you should consult an authorized financial advisor.

Notice to Prospective Investors in Australia

No placement document, prospectus, product disclosure statement or other disclosure document has been lodged with the Australian Securities and Investments Commission ("ASIC"), in relation to the offering.

This prospectus does not constitute a prospectus, product disclosure statement or other disclosure document under the Corporations Act 2001 (the "Corporations Act"), and does not purport to include the information required for a prospectus, product disclosure statement or other disclosure document under the Corporations Act.

Any offer in Australia of the shares may only be made to persons (the "Exempt Investors") who are "sophisticated investors" (within the meaning of section 708(8) of the Corporations Act), "professional investors" (within the meaning of section 708(11) of the Corporations Act) or otherwise pursuant to one or more exemptions contained in section 708 of the Corporations Act so that it is lawful to offer the shares without disclosure to investors under Chapter 6D of the Corporations Act.

The shares applied for by Exempt Investors in Australia must not be offered for sale in Australia in the period of 12 months after the date of allotment under the offering, except in circumstances where disclosure to investors under Chapter 6D of the Corporations Act would not be required pursuant to an exemption under section 708 of the Corporations Act or otherwise or where the offer is pursuant to a disclosure document which complies with Chapter 6D of the Corporations Act. Any person acquiring shares must observe such Australian on-sale restrictions.

This prospectus contains general information only and does not take account of the investment objectives, financial situation or particular needs of any particular person. It does not contain any securities recommendations or financial product advice. Before making an investment decision, investors need to consider whether the information in this prospectus is appropriate to their needs, objectives and circumstances, and, if necessary, seek expert advice on those matters.

Notice to Prospective Investors in Hong Kong

The securities have not been offered or sold and will not be offered or sold in Hong Kong, by means of any document, other than (a) to "professional investors" as defined in the Securities and Futures Ordinance (Cap. 571) of Hong Kong and any rules made under that Ordinance; or (b) in other circumstances which do not result in the document being a "prospectus" as defined in the Companies Ordinance (Cap. 32) of Hong Kong or which do not constitute an offer to the public within the meaning of that Ordinance. No advertisement, invitation or document relating to the securities has been or may be issued or has been or may be in the possession of any person for the purposes of issue, whether in Hong Kong or elsewhere, which is directed at, or the contents of which are likely to be accessed or read by, the public of Hong Kong (except if permitted to do so under the securities laws of Hong Kong) other than with respect to securities which are or are intended to be disposed of only to persons outside Hong Kong or only to "professional investors" as defined in the Securities and Futures Ordinance and any rules made under that Ordinance.

Notice to Prospective Investors in Japan

The securities have not been and will not be registered under the Financial Instruments and Exchange Law of Japan (Law No. 25 of 1948, as amended) and, accordingly, will not be offered or sold, directly or indirectly, in Japan, or for the benefit of any Japanese Person or to others for re-offering or resale, directly or indirectly, in Japan or to any Japanese Person, except in compliance with all applicable laws, regulations and ministerial guidelines promulgated by relevant Japanese governmental or regulatory authorities in effect at the relevant time. For the purposes of this paragraph, "Japanese Person" shall mean any person resident in Japan, including any corporation or other entity organized under the laws of Japan.

Notice to Prospective Investors in Singapore

This prospectus has not been registered as a prospectus with the Monetary Authority of Singapore. Accordingly, this prospectus and any other document or material in connection with the offer or sale, or invitation for subscription or purchase, of Non-CIS Securities may not be circulated or distributed, nor may the

Non-CIS Securities be offered or sold, or be made the subject of an invitation for subscription or purchase, whether directly or indirectly, to persons in Singapore other than (i) to an institutional investor under Section 274 of the Securities and Futures Act, Chapter 289 of Singapore (the "SFA"), (ii) to a relevant person pursuant to Section 275(1), or any person pursuant to Section 275(1A), and in accordance with the conditions specified in Section 275, of the SFA, or (iii) otherwise pursuant to, and in accordance with the conditions of, any other applicable provision of the SFA.

Where the Non-CIS Securities are subscribed or purchased under Section 275 of the SFA by a relevant person which is:

(a) a corporation (which is not an accredited investor (as defined in Section 4A of the SFA)) the sole business of which is to hold investments and the entire share capital of which is owned by one or more individuals, each of whom is an accredited investor; or

(b) a trust (where the trustee is not an accredited investor) whose sole purpose is to hold investments and each beneficiary of the trust is an individual who is an accredited investor,

securities (as defined in Section 239(1) of the SFA) of that corporation or the beneficiaries' rights and interest (howsoever described) in that trust shall not be transferred within six months after that corporation or that trust has acquired the Non-CIS Securities pursuant to an offer made under Section 275 of the SFA except:

(a) to an institutional investor or to a relevant person defined in Section 275(2) of the SFA, or to any person arising from an offer referred to in Section 275(1A) or Section 276(4)(i)(B) of the SFA;

(b) where no consideration is or will be given for the transfer;

(c) where the transfer is by operation of law;

(d) as specified in Section 276(7) of the SFA; or

(e) as specified in Regulation 32 of the Securities and Futures (Offers of Investments) (Shares and Debentures) Regulations 2005 of Singapore.

LEGAL MATTERS

The validity of the issuance of the securities offered hereby will be passed upon for us by Morgan, Lewis & Bockius LLP, New York, New York. Goodwin Procter LLP, New York, New York, is acting as counsel for the underwriters.

EXPERTS

The financial statements as of June 30, 2014 and 2013, and for each of the three years in the period ended June 30, 2014 and management's assessment of the effectiveness of internal control over financial reporting as of June 30, 2014, incorporated by reference into this prospectus supplement have been so incorporated in reliance on the reports of BDO USA, LLP, an independent registered public accounting firm, incorporated herein by reference, given on the authority of said firm as experts in auditing and accounting.

WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly and current reports, proxy statements and other information with the SEC. Our SEC filings are available to the public over the Internet at the SEC's website at http://www.sec.gov. The SEC's website contains reports, proxy and information statements and other information regarding issuers, such as us, that file electronically with the SEC. You may also read and copy any document we file with the SEC at the SEC's Public Reference Room at 100 F Street, N.E., Room 1580, Washington, D.C. 20549. You may also obtain copies of these documents at prescribed rates by writing to the SEC. Please call the SEC at 1-800-SEC-0330 for further information on the operation of its Public Reference Room.

INCORPORATION OF CERTAIN DOCUMENTS BY REFERENCE

The SEC allows us to "incorporate by reference" into this prospectus supplement the information we have filed with the SEC. The information we incorporate by reference into this prospectus supplement is an important part of this prospectus supplement. Any statement in a document we incorporate by reference into this prospectus supplement or the accompanying prospectus will be considered to be modified or superseded to the extent a statement contained in this prospectus supplement or any other subsequently filed document that is incorporated by reference into this prospectus supplement modifies or supersedes that statement. The modified or superseded statement will not be considered to be a part of this prospectus supplement or accompanying prospectus, as applicable, except as modified or superseded.

We incorporate by reference into this prospectus supplement the information contained in the documents listed below, which is considered to be a part of this prospectus supplement:

- our Annual Report on Form 10-K for the fiscal year ended June 30, 2014, filed on September 9, 2014;
- our Quarterly Report on Form 10-Q for the fiscal quarter ended September 30, 2014, filed on November 6, 2014;
- our Current Reports on Form 8-K filed with the SEC on September 2, 2014, December 4, 2014, December 8, 2014 and December 9, 2014;
- Our Definitive Proxy Statement on Schedule 14A for the annual meeting of stockholders held on December 3, 2014, filed on October 17, 2014; and
- the description of our common stock contained in the Registration Statement on Form 8-A filed on November 26, 2003 and any further amendment or report filed thereafter for the purpose of updating such description.

We also incorporate by reference all documents filed pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act after the date of this prospectus supplement and prior to the termination of this offering; provided, however, that we are not incorporating any information furnished under Item 2.02 or Item 7.01 of any current report on Form 8-K we may subsequently file.

Statements made in this prospectus supplement or the accompanying prospectus or in any document incorporated by reference in this prospectus supplement or the accompanying prospectus as to the contents of any contract or other document referred to herein or therein are not necessarily complete, and in each instance reference is made to the copy of such contract or other document filed as an exhibit to the documents incorporated by reference, each such statement being qualified in all material respects by such reference.

You may request a copy of these filings, at no cost, by writing or telephoning us at the following address:

MEI Pharma, Inc.
11975 El Camino Real, Suite 101
San Diego, California 92130
Te: (858) 792-6300
Attn: Investor Relations

Copies of these filings are also available, without charge, through the “Investors” section of our website (www.meipharma.com) as soon as reasonably practicable after they are filed electronically with the SEC. The information contained on our website is not a part of this prospectus supplement.

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PROSPECTUS

$150,000,000

MEI PHARMA, INC.

Common Stock
Preferred Stock
Warrants

We may offer up to $150,000,000 aggregate dollar amount of our common stock, preferred stock and warrants to purchase our common stock or preferred stock from time to time in one or more offerings. This prospectus provides you with a general description of the securities.

We may offer these securities at prices and on terms to be set forth in one or more supplements to this prospectus. These securities may be offered directly, through agents on our behalf or through underwriters or dealers.

Our common stock is traded on the Nasdaq Capital Market under the symbol "MEIP." On April 7, 2014, the closing price of our common stock on the Nasdaq Capital Market was $10.00 per share.

An investment in our securities involves significant risks. See "Risk Factors" on page 5 of this prospectus and in any applicable prospectus supplement and in the documents incorporated by reference in this prospectus for a discussion of factors you should carefully consider before deciding to purchase our securities.

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

The date of this prospectus is April 22, 2014.

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ABOUT THIS PROSPECTUS

Unless we have indicated otherwise, references in this prospectus to “MEI Pharma,” “we,” “us” and “our” or similar terms are to MEI Pharma, Inc., a Delaware corporation. References in this prospectus to “FDA” refer to the United States Food and Drug Administration.

This prospectus is part of a registration statement that we filed with the Securities and Exchange Commission, or SEC, utilizing a “shelf” registration statement. This prospectus provides you with a general description of the securities we may offer. We will describe the specific terms of those securities, as necessary, in supplements that we attach to this prospectus for each offering. Each supplement will also contain specific information about the terms of the offering it describes. The supplements may also add to, update or change information contained in this prospectus. In addition, as we describe in the sections entitled “Incorporation of Certain Information by Reference” and “Where You Can Find More Information,” we have filed and plan to continue to file other documents with the SEC that contain information about us. Before you decide whether to invest in our securities, you should read this prospectus, the supplement that further describes the offering of those securities and the information we otherwise file with the SEC.

The registration statement that contains this prospectus, including the exhibits to the registration statement, contains additional information about us and the securities being offered under this prospectus. You should read the registration statement and the accompanying exhibits for further information. The registration statement and exhibits can be read and are available to the public over the Internet at the SEC’s website at http: //www.sec.gov.

You should rely only on the information contained or incorporated by reference in this prospectus and in any prospectus supplement. We have not authorized any person to provide any information or make any statement that differs from what is contained in this prospectus. If any person does make a statement that differs from what is in this prospectus, you should not rely on it. This prospectus is not an offer to sell, nor is it a solicitation of an offer to buy, these securities in any state in which the offer or sale is not permitted. The information in this prospectus is accurate as of its date, but the information may change after that date. You should not assume that the information in this prospectus is accurate as of any date after its date.

SUMMARY

The Company

We are a development-stage oncology company focused on the clinical development of novel therapies for cancer. Our common stock is listed on the Nasdaq Capital Market under the symbol “MEIP”. We were incorporated in Delaware in 2000 as a wholly owned subsidiary of Novogen Limited (“Novogen”). In December 2012, Novogen distributed to its shareholders substantially all of its MEI Pharma common stock.

Our business purpose is the development of drugs for the treatment of cancer. We are principally focused on the clinical development of our lead drug candidate, Pracinostat, which we are currently investigating in three Phase II clinical trials. Pracinostat is an orally available histone deacetylase (HDAC) inhibitor that is being developed for advanced hematologic diseases such as myelodysplastic syndrome (MDS) and acute myeloid leukemia (AML). In August 2012, we completed the acquisition of certain assets and intellectual property, including those related to Pracinostat, from S*Bio Pte Ltd (“S*Bio”). Our clinical development pipeline also includes our isoflavone-based mitochondrial inhibitor drug candidate, ME-344. Results from a Phase I clinical trial of ME-344 in patients with refractory solid tumors were presented in October 2013. We plan to initiate a Phase Ib trial in small cell lung cancer and ovarian cancer during the second quarter of calendar year 2014. In September 2013, we acquired PWT143, an oral inhibitor of phosphatidylinositide 3-kinase (PI3K) delta, a molecular target that has been shown to play a critical role in the proliferation and survival of hematologic cancer cells. We expect to complete the pre-clinical work required to support the filing of an IND application for PWT143 by the end of calendar year 2014.

We own exclusive worldwide rights to all of our drug candidates, including Pracinostat, ME-344 and PWT143.

Clinical Product Development Programs

Lead Drug Candidate: Pracinostat

We are principally focused on the clinical development of our lead drug candidate, Pracinostat. Pracinostat is an orally available selective inhibitor of a group of enzymes called histone deacetylases, or HDACs. HDACs belong to a larger set of proteins collectively known as epigenetic regulators that can alter gene expression by chemically modifying DNA or its associated chromosomal proteins. Abnormal activity of these regulators is believed to play an important role in cancer and other diseases. There are currently two HDAC inhibitors – one oral and one injectable – approved by the FDA for the treatment of T-cell lymphoma.

Pracinostat has been tested in multiple Phase I and Phase II clinical trials in advanced hematologic malignancies, such as MDS, AML and myelofibrosis, as well as in solid tumor indications in both adult and pediatric patients. Pracinostat has been generally well tolerated in more than 200 patients to date, with readily manageable side effects often associated with drugs of this class, the most frequent of which is fatigue. The results of these studies also suggest that Pracinostat has potential best-in-class pharmacokinetic properties when compared to other oral HDAC inhibitors.

Pracinostat has demonstrated clinical evidence of single-agent activity in patients with AML and myelofibrosis. In a Phase I dose-escalation trial in patients with AML, 14% of evaluable patients (two out of 14) achieved a complete remission (CR), with the responses enduring for more than 206 and 362 days, respectively. These results were presented at the American Society of Hematology (ASH) Annual Meeting in December 2010. In a Phase II clinical trial in intermediate or high-risk myelofibrosis, 36% of patients (eight of 22) demonstrated clinical response from Pracinostat treatment, with 9% of patients (two out of 22) having a clinical improvement (anemia response) and 27% (six of 22) experiencing some reduction in splenomegaly. These results were published in the September 2012 issue of *Leukemia Research*.

Pracinostat has also shown evidence of synergistic activity when used in combination with the hypomethylating agent, Vidaza® (azacitidine), in patients with advanced MDS. Results from a pilot Phase II trial presented at the ASH Annual Meeting in December 2012 showed an overall response rate of 89% (eight out of nine) among the nine patients treated at the MD Anderson Cancer Center, including seven patients who achieved either a CR or a complete remission with incomplete blood count recovery (CRi). An additional patient treated at the University of Wisconsin-Madison achieved a CR, increasing the overall response rate in the trial to 90% (nine out of 10). The combination of Pracinostat and Vidaza was well tolerated in the study; the most frequent side effects were nausea and fatigue.

In June 2013, we initiated a double-blinded, placebo-controlled Phase II clinical trial of Pracinostat in combination with Vidaza in intermediate-2 or high-risk patients with previously untreated MDS. The multicenter trial is expected to enroll approximately 100 patients with a one-to-one randomization. Completion of enrollment is anticipated by the third quarter of calendar year 2014 with data expected in the first quarter of calendar year 2015. The primary endpoint of the study is CR. Secondary endpoints include overall response rate (CR+CRi+PR), hematologic improvement, duration of response, progression-free survival, rate of leukemic transformation, overall survival and safety.

In addition, we have initiated two open-label Phase II trials of Pracinostat: one in combination with Vidaza in elderly patients with AML who are not suited for intensive chemotherapy and the other in combination with Vidaza or Dacogen® (decitabine) in patients with MDS who either failed to respond or maintain a response to a hypomethylating agent alone. Preliminary data from both open-label trials are anticipated in December 2014.

In February 2014, the FDA granted orphan drug designation to Pracinostat for the treatment of AML. The designation provides orphan status to drugs defined by the FDA as those intended for the safe and effective treatment, diagnosis or prevention of rare diseases that affect fewer than 200,000 people in the U.S. Orphan designation qualifies us for certain development incentives, including tax credits for qualified clinical testing, prescription drug user fee exemptions and seven-year marketing exclusivity upon FDA approval.

Mitochondrial Inhibitor Drug Candidate: ME-344

ME-344 is our isoflavone-derived mitochondrial inhibitor drug candidate. In pre-clinical studies, ME-344 has been shown to cause cell death in multiple human tumor cell lines, including ovarian cancer stem cells, by interfering with mitochondrial energy generation. In April 2013, Dr. Ayesha Alvero, Yale University School of Medicine, presented data at the American Association for Cancer Research (AACR) Annual Meeting showing the ability of ME-344 to decrease tumor burden and delay recurrence in a pre-clinical *in vivo* model of recurrent epithelial ovarian cancer, the most lethal of all gynecological malignancies.

In October 2013, results from our first-in-human, single-agent Phase I clinical trial of ME-344 in patients with refractory solid tumors were presented at the AACR-NCI-EORTC International Conference on Molecular Targets and Cancer Therapeutics. The results indicated that eight of 21 evaluable patients (38%) treated with ME-344 achieved stable disease or better, including five who experienced progression-free survival that was at least twice the duration of their last prior treatment before entry into the study. In addition, one of these patients, a heavily pre-treated patient with small cell lung cancer, achieved a confirmed partial response. This patient remains on study and continues weekly dosing (85+ weeks as of April 1, 2014). ME-344 was generally well tolerated at doses equal to or less than 10 mg/kg delivered on a weekly schedule for extended durations. Dose limiting toxicities were observed at both the 15 mg/kg and 20 mg/kg dose levels, consisting primarily of Grade 3 peripheral neuropathy. Other medically significant adverse events observed in single patients included angina and QTc prolongation at the 10 mg/kg dose.

We are now preparing for a Phase Ib clinical trial of ME-344 in combination with Hycamtin® (topotecan) in small cell lung cancer and ovarian cancer, which we expect to initiate during the second quarter of calendar year 2014. The Phase Ib trial will be designed to evaluate the safety and tolerability of ME-344 in combination with

Hycamtin in a total of 45 patients with either small cell lung cancer or ovarian cancer. Hycamtin is a chemotherapy approved by the FDA for the treatment of small cell lung, ovarian and cervical cancers.

NADH Oxidase Drug Candidate: ME-143

ME-143 is our isoflavone-based NADH oxidase inhibitor drug candidate. Results from a Phase I dose-escalation study of intravenous ME-143 in patients with solid refractory tumors were presented at the American Society of Clinical Oncology Annual Meeting in June 2012. The data showed that ME-143 was generally well tolerated with the exception of a serious infusion reaction in one patient at the highest dose level. No additional clinical studies of ME-143 are planned at this time.

PI3-Kinase Delta Drug Candidate: PWT143

In September 2013, we acquired exclusive worldwide rights to PWT143 from Pathway Therapeutics, Inc. for an undisclosed upfront cash payment with no future milestone or royalty obligations. In pre-clinical studies, PWT143 has been found to be a potent and highly selective oral inhibitor of PI3-kinase delta, a molecular target that has been shown to play a critical role in the proliferation and survival of certain hematologic cancer cells. We expect to complete the required pre-clinical studies necessary for an IND filing by the end of calendar year 2014.

Corporate Information

Our principal executive offices are located at 11975 El Camino Real, Suite 101, San Diego, California, 92130, and our phone number is (858) 792-6300.

RISK FACTORS

Any investment in our securities involves a high degree of risk. In addition to the other information included or incorporated by reference in this prospectus and any accompanying prospectus supplement, you should carefully consider the important factors set forth under the heading “Risk Factors” in our Annual Report on Form 10-K for the fiscal year ended June 30, 2013, and in our subsequent annual reports on Form 10-K and in other reports we file with the SEC from time to time, which are incorporated herein by reference, before investing in our securities. Any of the risk factors referred to above could significantly and negatively affect our business, results of operations or financial condition, which may lower the trading price of our common stock. The risks referred to above are not the only ones that may exist. Additional risks not currently known by us or that we deem immaterial may also impair our business operations. You may lose all or a part of your investment. For further details, see the sections entitled “Where You Can Find More Information” and “Incorporation of Certain Information by Reference.”

CAUTIONARY STATEMENT ABOUT FORWARD-LOOKING STATEMENTS

This prospectus and the documents incorporated by reference herein include forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (the "Securities Act") and Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"). All statements other than statements of historical facts contained in this prospectus and in the documents incorporated by reference herein, including statements regarding the future financial position, business strategy and plans and objectives of management for future operations, are forward-looking statements. The words "believe," "may," "will," "estimate," "continue," "anticipate," "intend," "should," "plan," "expect," and similar expressions, as they relate to us, are intended to identify forward-looking statements. We have based these forward-looking statements largely on current expectations and projections about future events and financial trends that we believe may affect our financial condition, results of operations, business strategy and financial needs. These forward-looking statements are subject to a number of risks, uncertainties and assumptions, including, without limitation, those described in "Risk Factors" and elsewhere in this prospectus and the documents incorporated by reference herein, including, among other things:

- our inability to obtain required additional financing or financing available to us on acceptable terms, or at all, which may cause us to delay, scale-back or eliminate plans related to development of our drug candidates;
- we are in an early stage of clinical studies for our product candidates on which our development plans are based; clinical studies by their nature typically have a high level of risk and may not produce successful results;
- the results of pre-clinical studies and completed clinical trials are not necessarily predictive of future results, and our current drug candidates may not have favorable results in later studies or trials;
- our inability to maintain or enter into, and the risks resulting from our dependence upon, contractual arrangements necessary for the clinical development, manufacture, commercialization, marketing, sales and distribution of our product candidates;
- costs and delays in our clinical development programs and/or receipt of FDA or other required governmental or regulatory approvals, or the failure to obtain such approvals, for our product candidates;
- the FDA's interpretation and our interpretation of data from pre-clinical and clinical studies may differ significantly;
- our failure to successfully commercialize our product candidates;
- the failure of any products to gain market acceptance;
- our inability to control the costs of manufacturing our products;
- competition and competitive factors;
- our inability to protect our patents or proprietary rights and obtain necessary rights to third party patents and intellectual property to operate our business;
- our inability to operate our business without infringing the patents and proprietary rights of others;
- costs stemming from our defense against third party intellectual property infringement claims;
- general economic conditions;
- technological changes;
- government regulation generally;
- changes in industry practice; and
- one-time events.

These risks are not exhaustive. Other sections of this prospectus and the documents incorporated by reference herein include additional factors which could adversely impact our business and financial performance. Moreover, we operate in a very competitive and rapidly changing environment. New risk factors emerge from time to time and it is not possible for us to predict all risk factors, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements.

You should not rely upon forward looking statements as predictions of future events. We cannot assure you that the events and circumstances reflected in the forward looking statements will be achieved or occur. Although we believe that the expectations reflected in the forward looking statements are reasonable, we cannot guarantee future results, levels of activity, performance or achievements.

SECURITIES OFFERED BY THIS PROSPECTUS

Using this prospectus, we may offer from time to time, in one or more series, together or separately, at prices and terms to be determined at the time of offering:

- shares of common stock, $0.00000002 par value;
- shares of preferred stock, $0.01 par value; and
- warrants to purchase shares of common stock or preferred stock.

The shares of preferred stock may be convertible into or exchangeable for shares of our common stock or preferred stock issued by us.

See “Description of Securities” for a description of the terms of the common stock, preferred stock and warrants.

USE OF PROCEEDS

Although we expect to use a substantial portion of the net proceeds from the sale of securities under this prospectus for general corporate purposes, including to progress our clinical trial programs, we have not allocated these net proceeds for specific purposes. If, as of the date of any prospectus supplement, we have identified any additional use for the net proceeds, we will describe them in the prospectus supplement. The amount of securities offered from time to time pursuant to this prospectus and any prospectus supplement, and the precise amount of the net proceeds we will receive from the sale of such securities, as well as the timing of receipt of those proceeds, will depend upon our funding requirements. If we elect at the time of an issuance of securities to make different or more specific uses of the proceeds than as set forth herein, we will describe those uses in the applicable prospectus supplement.

RATIOS OF EARNINGS TO COMBINED FIXED CHARGES AND PREFERRED STOCK DIVIDENDS

We incurred net losses for the six months ended December 31, 2013 and for each of the fiscal years ended June 30, 2013, 2012, 2011, 2010 and 2009. We did not have any fixed charges for the six months ended December 31, 2013 or the fiscal years ended June 30, 2013, 2012 and 2011, other than insignificant charges related to a premises rental agreement. There were no fixed charges for the years ended June 30, 2010 and 2009. We had shares of preferred stock outstanding during the fiscal years ended June 30, 2012 and 2011; however, these shares of preferred stock were not entitled to dividends and no dividends were paid with respect to such shares. Accordingly, we are unable to present a ratio of earnings to combined fixed charges and preference share dividends.

PLAN OF DISTRIBUTION

We may sell the securities included in this prospectus (i) through agents, (ii) through underwriters, (iii) through dealers, (iv) directly to a limited number of purchasers or to a single purchaser, or (v) through a combination of any such methods of sale.

The distribution of the securities may be effected from time to time in one or more transactions, including block transactions and transactions on the Nasdaq Capital Market or any other organized market where the securities may be traded:

- at a fixed price or at final prices, which may be changed;
- at market prices prevailing at the time of sale;
- at prices related to such prevailing market prices; or
- at negotiated prices.

Offers to purchase securities may be solicited directly by us, or by agents designated by us, from time to time. Any such agent, which may be deemed to be an underwriter as that term is defined in the Securities Act, as amended, involved in the offer or sale of the securities in respect of which this prospectus is delivered will be named, and any commissions payable by us to such agent will be set forth, in the applicable prospectus supplement.

If an underwriter is, or underwriters are, utilized in the offer and sale of securities in respect of which this prospectus and the applicable prospectus supplement are delivered, we will execute an underwriting agreement with such underwriter(s) for the sale to it or them and the name(s) of the underwriter(s) and the terms of the transaction, including any underwriting discounts and other items constituting compensation of the underwriters and dealers, if any, will be set forth in such prospectus supplement, which will be used by the underwriter(s) to make resales of the securities in respect of which this prospectus and such prospectus supplement are delivered to the public. The securities will be acquired by the underwriters for their own accounts and may be resold from time to time in one or more transactions, including negotiated transactions, at a fixed public offering price or at varying prices determined at the time of sale. Any initial public offering price and any discounts or concessions allowed or reallowed or paid to dealers may be changed from time to time.

If a dealer is utilized in the sale of the securities in respect of which this prospectus is delivered, we will sell such securities to the dealer, as principal. The dealer may then resell such securities to the public at varying prices to be determined by such dealer at the time of resale. The name of the dealer and the terms of the transaction will be identified in the applicable prospectus supplement.

If an agent is used in an offering of securities being offered by this prospectus, the agent will be named, and the terms of the agency will be described, in the applicable prospectus supplement relating to the offering. Unless otherwise indicated in the prospectus supplement, an agent will act on a best efforts basis for the period of its appointment.

If indicated in the applicable prospectus supplement, we will authorize underwriters or their other agents to solicit offers by certain institutional investors to purchase securities from us pursuant to contracts providing for payment and delivery at a future date. Institutional investors with which these contracts may be made include commercial and savings banks, insurance companies, pension funds, investment companies, educational and charitable institutions and others. In all cases, these purchasers must be approved by us. The obligations of any purchaser under any of these contracts will not be subject to any conditions except that (a) the purchase of the securities must not at the time of delivery be prohibited under the laws of any jurisdiction to which that purchaser is subject, and (b) if the securities are also being sold to underwriters, we must have sold to these underwriters the securities not subject to delayed delivery. Underwriters and other agents will not have any responsibility in respect of the validity or performance of these contracts.

Certain of the underwriters, dealers or agents utilized by us in any offering hereby may be customers of, including borrowers from, engage in transactions with, and perform services for us or one or more of our affiliates in the ordinary course of business. Underwriters, dealers, agents and other persons may be entitled, under agreements which may be entered into with us, to indemnification against certain civil liabilities, including liabilities under the Securities Act.

Until the distribution of the securities is completed, rules of the SEC may limit the ability of the underwriters and certain selling group members, if any, to bid for and purchase the securities. As an exception to these rules, the representatives of the underwriters, if any, are permitted to engage in certain transactions that stabilize the price of the securities. Such transactions may consist of bids or purchases for the purpose of pegging, fixing or maintaining the price of the securities.

If underwriters create a short position in the securities in connection with the offering thereof (in other words, if they sell more securities than are set forth on the cover page of the applicable prospectus supplement), the representatives of such underwriters may reduce that short position by purchasing securities in the open market. Any such representatives also may elect to reduce any short position by exercising all or part of any over-allotment option described in the applicable prospectus supplement.

Any such representatives also may impose a penalty bid on certain underwriters and selling group members. This means that if the representatives purchase securities in the open market to reduce the underwriters' short position or to stabilize the price of the securities, they may reclaim the amount of the selling concession from the underwriters and selling group members who sold those shares as part of the offering thereof.

In general, purchases of a security for the purpose of stabilization or to reduce a syndicate short position could cause the price of the security to be higher than it might otherwise be in the absence of such purchases. The imposition of a penalty bid might have an effect on the price of a security to the extent that it was to discourage resales of the security by purchasers in the offering.

Neither we nor any of the underwriters, if any, makes any representation or prediction as to the direction or magnitude of any effect that the transactions described above may have on the price of the securities. In addition, neither we nor any of the underwriters, if any, makes any representation that the representatives of the underwriters, if any, will engage in such transactions or that such transactions, once commenced, will not be discontinued without notice.

The anticipated date of delivery of the securities offered by this prospectus will be described in the applicable prospectus supplement relating to the offering. The securities offered by this prospectus may or may not be listed on a national securities exchange or a foreign securities exchange. We cannot give any assurances that there will be a market for any of the securities offered by this prospectus and any prospectus supplement.

We will bear costs relating to all of the securities being registered under this prospectus, other than underwriters' discounts and commissions. In compliance with the guidelines of the Financial Services Regulatory Authority, Inc., or FINRA, the maximum compensation to be received by a FINRA member or independent broker-dealer may not exceed 8% of the offering proceeds. It is anticipated that the maximum compensation to be received in any particular offering of securities will be less than this amount.

DESCRIPTION OF SECURITIES

Securities We May Offer Under this Prospectus

Common Stock

For a description of our common stock, please see our Registration Statement on Form 8-A filed with the SEC on November 26, 2003, and any further amendment or report filed thereafter for the purpose of updating such description.

Preferred Stock

The material terms of any series of preferred stock that we offer through a prospectus supplement will be described in that prospectus supplement. Our board of directors is authorized to provide for the issuance of blank check preferred stock in one or more series with designations as may be stated in the resolution or resolutions providing for the issue of such preferred shares. At the time that any series of our preferred stock is authorized, our board of directors will fix the dividend rights, any conversion rights, any voting rights, redemption provisions, liquidation preferences and any other rights, preferences, privileges and restrictions of that series, as well as the number of shares constituting that series and their designation. Our board of directors could, without stockholder approval, cause us to issue preferred stock which has voting, conversion and other rights that could adversely affect the holders of our common stock or make it more difficult to effect a change in control. Our preferred stock could be used to dilute the share ownership of persons seeking to obtain control of us and thereby hinder a possible takeover attempt which, if our stockholders were offered a premium over the market value of their shares, might be viewed as being beneficial to our stockholders. In addition, our preferred stock could be issued with voting, conversion and other rights and preferences which would adversely affect the voting power and other rights of holders of our common stock.

Warrants

We may issue warrants to purchase our common stock or preferred stock. Warrants may be issued independently or together with any other securities and may be attached to, or separate from, such securities. Each series of warrants will be issued under a separate warrant agreement to be entered into between us and a warrant agent. The terms of any warrants to be issued and a description of the material provisions of the applicable warrant agreement will be set forth in the applicable prospectus supplement.

The applicable prospectus supplement will describe the following terms of any warrants in respect of which this prospectus is being delivered:

- the title of such warrants;
- the aggregate number of such warrants;
- the price or prices at which such warrants will be issued;
- the currency or currencies, in which the price of such warrants will be payable;
- the securities purchasable upon exercise of such warrants;
- the price at which and the currency or currencies in which the securities or other rights purchasable upon exercise of such warrants may be purchased;
- the date on which the right to exercise such warrants shall commence and the date on which such right shall expire;
- if applicable, the minimum or maximum amount of such warrants which may be exercised at any one time;
- if applicable, the designation and terms of the securities with which such warrants are issued and the number of such warrants issued with each such security;

- if applicable, the date on and after which such warrants and the related securities will be separately transferable;
- information with respect to book-entry procedures, if any;
- if applicable, a discussion of any material United States federal income tax considerations; and
- any other terms of such warrants, including terms, procedures and limitations relating to the exchange and exercise of such warrants.

Description of Share Capital

We are authorized to issue 113,000,000 shares of common stock, par value $0.00000002 per share, and 100,000 shares of preferred stock, par value $0.01 per share. As of April 7, 2014, we had 21,607,234 shares of common stock outstanding and no shares of preferred stock outstanding. Also as of April 7, 2014, we had outstanding (i) 1,136,100 shares of our common stock subject to outstanding options, with exercise prices ranging from $2.76 to $30.30 per share, (ii) 400,000 restricted stock units, each representing the contingent right to receive one share of our common stock, (iii) 4,898,665 shares of our common stock subject to outstanding warrants, with exercise prices ranging from $3.12 to $7.14 per share, (iv) based on an assumed price per share of $10.00, which was the last reported sale price of our common stock on the Nasdaq Capital Market on April 7, 2014, up to 50,000 shares of common stock that may be issuable upon our achievement of certain clinical and regulatory milestones pursuant to the terms of the August 2012 Asset Purchase Agreement between the Company and S*Bio, and (v) 716,233 shares of our common stock available for awards under our Amended and Restated 2008 Stock Omnibus Equity Compensation Plan.

LEGAL MATTERS

The validity of the securities described herein will be passed upon for us by Morgan, Lewis & Bockius LLP.

EXPERTS

The financial statements as of June 30, 2013 and 2012, and for each of the two years in the period ended June 30, 2013 and for the period from inception (December 1, 2000) to June 30, 2013, incorporated by reference in this prospectus have been so incorporated in reliance on the report of BDO USA, LLP, an independent registered public accounting firm, incorporated herein by reference, given on the authority of said firm as experts in auditing and accounting.

INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

The SEC allows us to "incorporate by reference" into this prospectus and any accompanying prospectus supplement the information we have filed with the SEC. The information we incorporate by reference into this prospectus is an important part of this prospectus. Any statement in a document we incorporate by reference into this prospectus will be considered to be modified or superseded to the extent a statement contained in this prospectus, any accompanying prospectus supplement or any other subsequently filed document that is incorporated by reference into this prospectus or any accompanying prospectus supplement modifies or supersedes that statement. The modified or superseded statement will not be considered to be a part of this prospectus or any accompanying prospectus supplement, as applicable, except as modified or superseded.

We incorporate by reference into this prospectus the information contained in the documents listed below, which are considered to be a part of this prospectus:

- our Annual Report on Form 10-K for the fiscal year ended June 30, 2013, as amended by the Form 10-K/A filed on September 27, 2013;
- our Quarterly Reports on Form 10-Q for the quarters ended September 30, 2013 and December 31, 2013;
- our Current Reports on Form 8-K filed with the SEC on October 21, 2013, October 29, 2013, December 6, 2013, March 26, 2014 and April 8, 2014; and
- the description of our common stock contained in the Registration Statement on Form 8-A filed on November 26, 2003 and any further amendment or report filed thereafter for the purpose of updating such description.

We also incorporate by reference all documents filed pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act after (i) the date of the initial registration statement and prior to the effectiveness of the registration statement and (ii) the date of this prospectus and prior to the termination of the offering of the securities under this registration statement (except in each case for the information contained in such documents that is deemed to be "furnished" and not "filed").

Statements made in this prospectus or any accompanying prospectus supplement or in any document incorporated by reference in this prospectus or any accompanying prospectus supplement as to the contents of any contract or other document referred to herein or therein are not necessarily complete, and in each instance reference is made to the copy of such contract or other document filed as an exhibit to the documents incorporated by reference, each such statement being qualified in all material respects by such reference.

You may request a copy of these filings, at no cost, by writing or telephoning us at the following address:

MEI Pharma, Inc.
11975 El Camino Real, Suite 101
San Diego, California 92130
Tel: (858) 792-6300
Attn: Investor Relations

Copies of these filings are also available, without charge, through the "Investors" section of our website (www.meipharma.com) as soon as reasonably practicable after they are filed electronically with the SEC. The information contained on our website is not a part of this prospectus.

WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly and current reports, proxy statements and other information with the SEC. Our SEC filings are available to the public over the Internet at the SEC's website at http://www.sec.gov. The SEC's website contains reports, proxy and information statements and other information regarding issuers, such as us, that file electronically with the SEC. You may also read and copy any document we file with the SEC at the SEC's Public Reference Room at 100 F Street, N.E., Room 1580, Washington, D.C. 20549. You may also obtain copies of these documents at prescribed rates by writing to the SEC. Please call the SEC at 1-800-SEC-0330 for further information on the operation of its Public Reference Room.

10,000,000 Shares

Common Stock

PROSPECTUS SUPPLEMENT

BofA Merrill Lynch

Cowen and Company

Stifel

Wedbush PacGrow Life Sciences

December 11, 2014