PROSPECTUS SUPPLEMENT
(to prospectus dated October 20, 2011)

Filed pursuant to Rule 424(b)(5)
Registration No. 333-177009

$95,000,000 Common Stock

Pluristem Therapeutics Inc. has entered into an at-the-market issuance sales agreement, or sales agreement, with MLV & Co. LLC, or MLV, relating to shares of its common stock offered by this prospectus supplement. In accordance with the terms of the sales agreement, we may, through MLV, from time to time offer and sell shares of our common stock having an aggregate offering price of up to $95,000,000.

Our common stock is listed on The NASDAQ Capital Market under the symbol "PSTI." On December 24, 2012, the last reported sale price of our common stock on The NASDAQ Capital Market was $3.27 per share. Our common stock is also listed on the Tel Aviv Stock Exchange, or TASE, under the symbol "PLTR."

Sales of our common stock, if any, under this prospectus may be made in sales deemed to be "at-the-market" equity offerings as defined in Rule 415 promulgated under the Securities Act of 1933, as amended, or the Securities Act, including sales made directly on or through The NASDAQ Capital Market, the existing trading market for our common stock, sales made to or through a market maker other than on an exchange or otherwise, in negotiated transactions at market prices prevailing at the time of sale or at prices related to such prevailing market prices, and/or any other method permitted by law. MLV will act as a sales agent on a best efforts basis using commercially reasonable efforts consistent with its normal trading and sales practices, on mutually agreed terms between MLV and us. There is no arrangement for funds to be received in any escrow, trust or similar arrangement.

The compensation to MLV for sales of common stock sold pursuant to the sales agreement is an aggregate of up to 3.0% of the gross proceeds of the sales price per share. In connection with the sale of the common stock on our behalf, MLV will be deemed to be an "underwriter" within the meaning of the Securities Act, and the compensation of MLV will be deemed to be underwriting commissions or discounts. We have also agreed to provide indemnification and contribution to MLV with respect to certain liabilities, including liabilities under the Securities Act.

Investing in our securities involves a high degree of risk. See "Risk Factors" beginning on page S-4 of this prospectus supplement and the corresponding sections in the accompanying prospectus and in our Annual Report on Form 10-K for our fiscal year ended June 30, 2012, and our subsequent filings with the Securities and Exchange Commission under the Securities Exchange Act of 1934, as amended, which are incorporated by reference into this prospectus supplement.

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

Prospectus Supplement dated December 26, 2012.

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About this Prospectus Supplement

A registration statement on Form S-3 (File No. 333-177009) utilizing a "shelf" registration process relating to the securities described in this prospectus supplement was initially filed with the Securities and Exchange Commission, or the SEC, on September 26, 2011, and was declared effective by the SEC on October 20, 2011. Under this "shelf" registration process, of which this offering is a part, we may, from time to time, sell our common stock, preferred stock, warrants and units.

This document is in two parts. The first part is this prospectus supplement, which describes the terms of this offering of our shares of common stock and also adds, updates and changes information contained in the accompanying prospectus and the documents incorporated therein by reference. The second part is the accompanying prospectus, which gives more general information, some of which may not apply to this offering. To the extent the information contained in this prospectus supplement differs or varies from the information contained in the accompanying prospectus or any document filed prior to the date of this prospectus supplement and incorporated herein by reference, the information in this prospectus supplement will govern. In addition, this prospectus supplement and the accompanying prospectus do not contain all of the information provided in the registration statement that we filed with the SEC. For further information about us, you should refer to that registration statement, which you can obtain from the SEC as described below under "Where You Can Find More Information."

You should rely only on the information contained in or incorporated by reference into this prospectus supplement and the accompanying prospectus. We have not, and MLV has not, authorized anyone to provide you with information that is different. This prospectus supplement is not an offer to sell or solicitation of an offer to buy our securities in any circumstances under which the offer or solicitation is unlawful. We are offering to sell, and seeking offers to buy, our securities only in jurisdictions where offers and sales are permitted. You should not assume that the information we have included in this prospectus supplement or the accompanying prospectus is accurate as of any date other than the date of this prospectus supplement or the accompanying prospectus, respectively, or that any information we have incorporated by reference is accurate as of any date other than the date of the document incorporated by reference, regardless of the time of delivery of this prospectus supplement or of any of our securities. Our business, financial condition, results of operations and prospects may have changed since those dates.

Unless the context otherwise requires, all references in this prospectus to "we," "our," "our company," "Pluristem," "PSTI," "us" and the "Company" refer to Pluristem Therapeutics Inc. and its subsidiary. Our name and logo and the names of our products are our trademarks or registered trademarks.

Special Note Regarding Forward-Looking Information

This prospectus supplement and the documents we incorporate by reference in this prospectus supplement contain forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995 and other Federal securities laws. All statements, other than statements of historical fact, that we include in this prospectus supplement and in the documents we incorporate by reference in this prospectus supplement, may be deemed forward-looking statements for purposes of the Securities Act of 1933, or the Securities Act, and the Exchange Act. We use the words "anticipate," "believe," "estimate," "expect," "intend," "may," "plan," "project," "will," "would" and similar expressions to identify forward-looking statements, although not all forward-looking statements contain these identifying words. For example, we are using forward looking statements when we mention that we develop PLX cells that may treat systemic diseases and potentially obviate the need to use the intravenous route, when we discuss our strategy and the potential that it will be successful, and when we describe the planned execution of our strategy, including the development of in-house production capacity that can be used commercially and potential collaborations and relationships with research and clinical institutions and other companies. We cannot guarantee that we will achieve the plans, intentions or expectations and conduct the clinical studies described in our forward-looking statements, achieve success in such studies, enter into collaborations with other companies or develop relationships with research and clinical institutions, and, accordingly, you should not place undue reliance on our forward-looking statements. There are a number of important factors that could cause actual results or events to differ materially from the forward-looking statements that we make, including the factors included in the documents we incorporate by reference in this prospectus supplement. You should read these factors and the other cautionary statements made in the documents we incorporate by reference as being applicable to all related forward-looking statements wherever they appear in this prospectus supplement, the accompanying prospectus and any document incorporated by reference. We caution you that, except as otherwise required by law, we do not undertake any obligation to update forward-looking statements we make.

Prospectus Supplement Summary

This summary highlights information contained elsewhere or incorporated by reference into this prospectus supplement and the accompanying prospectus. This summary does not contain all of the information that you should consider before investing in our securities. You should carefully read the entire prospectus supplement and the accompanying prospectus, including the "Risk Factors" sections, starting on page S-4 of this prospectus supplement, page 4 of the accompanying prospectus and page 10 of our Annual Report on Form 10-K for the fiscal year ended June 30, 2012, as well as the financial statements and the other information incorporated by reference herein, before making an investment decision.

Overview

We are a bio-therapeutics company developing standardized cell therapy products for the treatment of life threatening diseases. Our patented PLX (PLacental eXpanded) cells are a drug delivery platform that releases a number of therapeutic proteins in response to various local and systemic inflammatory and ischemic diseases. PLX cells are grown using our proprietary 3D micro-environmental technology that produces an "off-the-shelf" product that requires no tissue matching prior to administration. We are focusing on the development of PLX cells administered locally to potentially treat systemic diseases and potentially obviating the need to administer the drugs intravenously.

Our strategy is to develop and produce cell therapy products for the treatment of multiple disorders using several methods of administration. We plan to execute this strategy independently, using our own personnel, and through relationships with research and clinical institutions or in collaboration with other companies, such as United Therapeutics Corporation, or United. We are planning to have in-house production capacity to grow clinical grade PLX cells in commercial quantities and to control all of our proprietary manufacturing processes.

Corporate Information

We were incorporated in the State of Nevada on May 11, 2001. Since 2003, we have operated a wholly owned research and development subsidiary based in Israel called Pluristem, Ltd. Our principal offices are located in Israel at MATAM Advanced Technology Park, Building No. 20, Haifa, Israel 31905. We maintain a website at www.pluristem.com. This website is not a part of this prospectus supplement and should not be deemed "filed" under the Securities Exchange Act of 1934, as amended, or the Exchange Act.

The Offering

Issuer	Pluristem Therapeutics Inc.
Shares of common stock offered	Shares having an aggregate offering price of up to $95,000,000*.
Manner of offering	"At-the-market" offering of shares of common stock. The sale of shares of our common stock under this prospectus supplement, if any, may be made directly on The NASDAQ Capital Market, or through a market maker other than on an exchange. With our prior written consent, sales may also be made in negotiated transactions and/or any other method permitted by law. See "Plan of Distribution" on page S-9 of this prospectus supplement.
Sales Agent	MLV & Co. LLC
Use of proceeds	We intend to use the net proceeds from this offering, if any, for expenses related to the conduct of our clinical trials, research and product development activities, and for general corporate purposes, including general working capital purposes. See "Use of Proceeds" on page S-7.
Risk factors	See "Risk Factors" beginning on page S-4 of this prospectus supplement and page 4 of the accompanying prospectus for a discussion of the risks you should carefully consider before deciding to invest in our securities.
Listing on NASDAQ Capital Market and TASE	Our common stock is listed on The NASDAQ Capital Market under the symbol "PSTI" and on the TASE under the symbol "PLTR."

* In the future, we may need to increase our authorized share capital in order to continue selling our shares under the Sales Agreement.

Risk Factors

Investing in our securities involves significant risks. Before making an investment decision, you should carefully consider the risks described below, in the accompanying prospectus and in our most recent Annual Report on Form 10-K and in our subsequent filings with the SEC, together with all of the other information appearing herein or incorporated herein by reference, in light of your particular investment objectives and financial circumstances. The risks so described are not the only risks we face. Additional risks not presently known to us or that we currently deem immaterial may also impair our business operations. Our business, financial condition and results of operations could be materially adversely affected by any of these risks. The trading price of our securities could decline due to any of these risks, and you may lose all or part of your investment. The discussion of risks includes or refers to forward-looking statements; you should read the explanation of the qualifications and limitations on such forward-looking statements discussed elsewhere herein or incorporated herein by reference.

We have a limited operating history in our business of developing and commercializing cell therapy products.

We have a limited operating history in our business of developing and commercializing cell therapy products. We have generated revenues since our inception only in connection with the United Agreement, and we will, in all likelihood, continue to incur operating expenses without significant revenues until we successfully develop and commercialize our cell therapy products. Our primary sources of funds have been the sale of our securities, government grants and revenues from the United Agreement. We cannot give assurances that we will be able to generate any recurring and significant revenues or income. These circumstances make us dependent on additional financial support until profitability is achieved. There is no assurance that we will ever be profitable or that we will be able to continue as a going concern in the long term.

Our success will depend in part on our ability to protect our technology and products with patents.

The patent position of biotechnology and pharmaceutical companies generally is highly uncertain, involves complex legal and factual questions and has in recent years been the subject of much litigation. As a result, the issuance, scope, validity, enforceability and commercial value of our and any future licensors' patent rights are highly uncertain. Our pending and future patent applications may not result in patents being issued which protect our technology or products or which effectively prevent others from commercializing competitive technologies and products. Changes in either the patent laws or interpretation of the patent laws in the United States and other countries may diminish the value of our patents or narrow the scope of our patent protection. The laws of foreign countries may not protect our rights to the same extent as the laws of the United States and we may not be able to obtain meaningful patent protection for any of our commercial products either in or outside the United States.

We have three issued U.S. patents and nineteen issued non-U.S. patents. Our issued patents which claim priority from US application no. 60/118,789 will expire in 2020. These patents are directed to methods for maintaining and expanding undifferentiated hematopoietic stem cells and to the use of those cells in cell therapy. In addition, we have a granted European patent with claims directed to the use of placenta (and adipose) derived cells for treatment of ischemic diseases that is now in the opposition period. We have seventeen pending U.S. patent applications and seventy-nine pending non-U.S. patent applications (including two International Applications). If any of these pending patent applications were to issue as patents, they would be expected to expire sometime between 2020 and 2031. Issued patents (in South Africa and the Russian Federation) and pending applications claiming priority from provisional no. 60/784,769 are directed to 3D expanded placenta and adipose derived cells, their methods of manufacture and methods of use. These issued patents and pending applications (if they were to issue) are expected to expire in 2027. Issued patents (in Europe, Singapore and South Africa) and pending applications claiming priority from provisional no. 60/960,184 are directed to methods of using placenta and adipose derived cells for treating both ischemic diseases and for regeneration of connective tissue. These issued patents and pending applications (if they were to issue) are expected to expire in 2028. The patent approval process is complex and its outcome is unpredictable. It is therefore highly uncertain whether we will be able to obtain protection from any of our pending patent applications. We do not currently have and may not be able to obtain any composition of matter protection for any of our stem cell product candidates. No assurance can be given that any of our pending patent applications or future patent applications will be approved, that the scope of any patent protection granted will exclude competitors or provide us with competitive advantages, that any of the patents that have been or may be issued to us will be held valid if subsequently challenged, or that other parties will not claim rights to or ownership of our patents or other proprietary rights that we hold. We may become party to, or threatened with, future adversarial proceedings or litigation regarding our intellectual property rights, including interference proceedings before the U.S. Patent and Trademark Office and opposition proceedings before the European Patent Office. If we are unable to obtain meaningful patent protection for our products and processes, we may not be able to effectively prevent others from marketing the same or similar products or otherwise directly competing with us. Furthermore, there can be no assurance that others have not developed or will not develop the same or similar products, duplicate any of our technology or products or design around any patents that have been or may be issued to us or any future licensors. Since patent applications in the United States and in Europe are not publicly disclosed until they are published, there can be no assurance that others did not first file applications for products covered by our pending patent applications, nor can we be certain that we will not infringe any patents that may be issued to others pursuant to such applications.

We are committed to protecting our intellectual property position and to aggressively pursuing our patent portfolio.

Third parties may initiate legal proceedings alleging that we are infringing their intellectual property rights, the outcome of which would be uncertain and could have a material adverse effect on the success of our business.

Our commercial success depends upon our ability and the ability of our collaborators to develop, manufacture, market and sell our product candidates and use our proprietary technologies without infringing the proprietary rights of third parties. We have yet to conduct comprehensive freedom-to-operate searches to determine whether our proposed business activities or use of certain of the patent rights owned by us would infringe patents issued to third parties. We may become party to, or threatened with, future adversarial proceedings or litigation regarding intellectual property rights with respect to our products and technology. Third parties may assert infringement claims against us based on existing patents or patents that may be granted in the future. If we are found to infringe a third party's intellectual property rights, we could be required to obtain a license from such third party to continue developing and marketing our products and technology. However, we may not be able to obtain any required license on commercially reasonable terms or at all. Even if we were able to obtain a license, it could be non-exclusive, thereby giving our competitors access to the same technologies licensed to us. We could be forced, including by court order, to cease commercializing the infringing technology or product. In addition, we could be found liable for monetary damages. A finding of infringement could prevent us from commercializing our product candidates or force us to cease some of our business operations, which could materially harm our business. For example, we are aware of issued third party patents directed to placental stem cells and their use for therapy and in treating various diseases. We may need to seek a license for one or more of these patents. No assurances can be given that such a license will be available on commercially reasonable terms, if at all. Claims that we have misappropriated the confidential information or trade secrets of third parties could have a similar negative impact on our business.

Even if resolved in our favor, litigation or other legal proceedings relating to intellectual property claims may cause us to incur significant expenses, and could distract our technical and management personnel from their normal responsibilities. In addition, there could be public announcements of the results of hearings, motions or other interim proceedings or developments and if securities analysts or investors perceive these results to be negative, it could have a substantial adverse effect on the price of our common stock. Such litigation or proceedings could substantially increase our operating losses and reduce the resources available for development activities or any future sales, marketing or distribution activities. We may not have sufficient financial or other resources to adequately conduct such litigation or proceedings. Some of our competitors may be able to sustain the costs of such litigation or proceedings more effectively than we can because of their greater financial resources. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could have a material adverse effect on our ability to compete in the marketplace.

We have built the ability to manufacture clinical grade Adherent Stromal Cells, or ASCs, in-house. Through our experience with ASC-based product development, we have developed expertise and know-how in this field. To protect this expertise and know-how, our policies require confidentiality agreements with our employees, consultants, contractors, manufacturers and advisors. These agreements generally provide for protection of confidential information, restrictions on the use of materials and assignment of inventions conceived during the course of performance for us. These agreements might not effectively prevent disclosure of our confidential information. Moreover, there can be no assurance that any of our know-how is or will be protectable as a trade secret, or that our competitors will not be able to independently develop the same or competing technology without violating any of our protectable trade secret rights, if any.

We own our intellectual property and we have no obligations to pay royalties to any third party, except for: (i) royalties to the Office of Chief Scientist (see note 8e in our audited consolidated financial statements for fiscal year 2012 included in our Annual Report on Form 10-K for the fiscal year ended June 30, 2012); and (ii) royalties payable to the Berlin-Brandenburg Center for Regenerative Therapies at Charité - University Medicine Berlin, or Charité, for new developments made within the scope of the services Charité provides under the agreement between us and Charité in an amount to be agreed upon by the parties in the future ranging between 1%-6% of revenues actually received by us from such developments.

We must further protect and develop our technology and products in order to become a profitable company.

The initial patents underlying our technology are directed to methods of maintaining and expanding undifferentiated hematopoietic stem cells and to the use of those cells in cell therapy. If we do not create additional sufficient layers of patents, other companies may use our technology to develop competing products. If this happens, we may not be able to obtain a competitive position and our business would likely suffer.

Furthermore, the scope of our patents may not be sufficiently broad to offer meaningful protection. In addition, our patents could be successfully challenged, invalidated or circumvented so that our patent rights would not create an effective competitive barrier.

Favorable results from compassionate use treatment or initial interim results from a clinical trial do not ensure that the trial will be successful and success in early-stage clinical trials does not ensure success in later-stage clinical trials.

PLX cells have been administered as part of compassionate use treatments, which permit the administration of the PLX cells outside of clinical trials. Such treatments showed promising results at the time they were given, and our stock price has risen since our public announcements relating to such results. No assurance can be given that any positive results are attributable to the PLX cells, or that administration of PLX cells to other patients will have positive results. As far as we are aware, two of the three patients that received compassionate treatment in our PLX cells have died within four and six months after such treatment was completed. Compassionate use is a term that is used to refer to the use of an investigational drug outside of a clinical trial to treat a patient with a serious or immediately life-threatening disease or condition who has no comparable or satisfactory alternative treatment options. Regulators often allow compassionate use on a case-by-case basis for an individual patient or for defined groups of patients with similar treatment needs.

There is no assurance that we will obtain regulatory approval for PLX cells. To date, the FDA has not approved any stem-cell based drugs. We will only obtain regulatory approval to commercialize a product candidate if we can demonstrate to the satisfaction of the FDA or the applicable non-U.S. regulatory authorities, in well-designed and conducted clinical trials, that the product candidate is safe and effective and that the product candidate, including the stem cell production methodology, otherwise meets the appropriate standards required for approval. Clinical trials can be lengthy, complex and extremely expensive processes with uncertain results. A failure of one or more clinical trials may occur at any stage of testing.

Success in early clinical trials does not ensure that later clinical trials will be successful, and initial results from a clinical trial do not necessarily predict final results. While results from treating patients through compassionate use have in certain cases been successful, we cannot be assured that further trials will ultimately be successful. Results of further clinical trials may be disappointing.

Even if early stage clinical trials are successful, we may need to conduct additional clinical trials for product candidates with patients receiving the drug for longer periods before we are able to seek approvals to market and sell these product candidates from the FDA and regulatory authorities outside the U.S. Even if we are able to obtain approval for our product candidates through some sort of accelerated approval review program, we may still be required to conduct clinical trials after such an approval. If we are not successful in commercializing any of our lead product candidates, or are significantly delayed in doing so, our business will be materially harmed.

Since we have broad discretion in how we use the proceeds from this offering, we may use the proceeds in ways with which you disagree.

We have not allocated specific amounts of the net proceeds from this offering for any specific purpose. Accordingly, our management will have significant flexibility in applying the net proceeds of this offering. You will be relying on the judgment of our management with regard to the use of these net proceeds, and you will not have the opportunity, as part of your investment decision, to assess whether the proceeds are being used in ways with which you would agree. It is possible that the net proceeds will be invested in a way that does not yield a favorable, or any, return for the Company. The failure of our management to use such funds effectively could have a material adverse effect on our business, financial condition, operating results and cash flow.

Investors in this offering may pay a substantially higher price than the book value of our shares.

The offering price per share in this offering may exceed the net tangible book value per share of our common stock outstanding prior to this offering. Assuming that an aggregate of 29,051,988 shares of our common stock are sold at a price of $3.27 per share, the last reported sale price of our common stock on The NASDAQ Capital Market on December 24, 2012, for aggregate gross proceeds of approximately $95,000,000 million, and after deducting commissions and estimated aggregate offering expenses payable by us, you will experience immediate dilution of $1.36 per share, representing the difference between our as adjusted net tangible book value per share as of September 30, 2012 after giving effect to this offering at the assumed size and offering price. The exercise of outstanding stock options and warrants will result in further dilution of your investment. See the section herein entitled “Dilution” for a more detailed illustration of the dilution you would incur if you participate in this offering.

Future sales of our shares may cause the prevailing market price of our shares to decrease.

Future sales of our common stock, including pursuant to our sales agreement with MLV or other public or private offerings of our shares, or the perception that such sales may occur, could cause immediate dilution and adversely affect the market price of our common stock.

In addition, we have reserved a substantial number of shares issued or issuable upon exercise of warrants and options to purchase our shares that are eligible for, or may become eligible for, unrestricted resale. Any sales of such shares in the public market or otherwise could reduce the prevailing market price for our shares, as well as make future sales of equity securities by us less attractive or even not feasible. The sale of shares issued upon the exercise of our options and warrants could also further dilute the holdings of our then existing shareholders.

Use of Proceeds

We intend to use the net proceeds from this offering, if any, to fund the preparation and conduct of our clinical studies, research and product development activities, and for general corporate purposes, including working capital and administrative expenses. The amounts and timing of the expenditures may vary significantly depending on numerous factors, such as the progress of our preparation for the clinical trials and other research and development efforts, technological advances and the competitive environment for our products. Pending the use of the net proceeds, we intend to invest the net proceeds in accordance with our investment policy set by our investment committee, as amended from time to time.

Dividend Policy

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

Dilution

If you purchase shares of our common stock in this offering, your interest will be diluted to the extent of the difference between the public offering price per share and the net tangible book value per share of our common stock after this offering. Our net tangible book value as of September 30, 2012, was approximately $72.19 million, or approximately $1.26 per share. Net tangible book value per share is equal to total assets minus the sum of total liabilities and intangible assets divided by the total number of shares outstanding.

After giving effect to the sale of our common stock during the term of the sales agreement with MLV in the aggregate amount of $95,000,000 at an assumed offering price of $3.27 per share, the last reported sale price of our common stock on The NASDAQ Capital Market on December 24, 2012, and after deducting commissions and estimated aggregate offering expenses payable by us, our net tangible book value as of September 30, 2012 would have been $165.19 million, or $1.91 per share of our common stock. This amount represents an immediate increase in net tangible book value to existing shareholders of $0.65 per share and an immediate dilution in net tangible book value of $1.36 per share to purchasers of our shares of common stock in this offering, as illustrated in the following table:

Assumed public offering price per share		$ 3.27
Net tangible book value per share as of September 30, 2012	$ 1.26	
Increase in net tangible book value per share after giving effect to this offering	$ 0.65	
Pro forma net tangible book value per share as of September 30, 2012		$ 1.91
Dilution in net tangible book value per share to new investors		$ 1.36

The table above assumes for illustrative purposes that an aggregate of 29,051,988 shares of our common stock are sold during the term of the sales agreement with MLV at a price of $3.27 per share, the last reported sale price of our common stock on The NASDAQ Capital Market on December 24, 2012, for aggregate gross proceeds of $95,000,000. In fact, the shares subject to the sales agreement with MLV will be sold, if at all, from time to time at prices that may vary. An increase of $1.00 per share in the price at which the shares are sold from the assumed offering price of $3.27 per share shown in the table above, assuming all of our common stock in the aggregate amount of $95,000,000 during the term of the sales agreement with MLV is sold at that price, would increase our adjusted net tangible book value per share after the offering to $2.08 per share and would increase the dilution in net tangible book value per share to new investors in this offering to $2.19 per share, after deducting commissions and estimated aggregate offering expenses payable by us. A decrease of $1.00 per share in the price at which the shares are sold from the assumed offering price of $3.27 per share shown in the table above, assuming all of our common stock in the aggregate amount of $95,000,000 during the term of the sales agreement with MLV is sold at that price, would decrease our adjusted net tangible book value per share after the offering to $1.67 per share and would decrease the dilution in net tangible book value per share to new investors in this offering to $0.60 per share, after deducting commissions and estimated aggregate offering expenses payable by us. This information is supplied for illustrative purposes only.
The discussion and table above are based on 57,257,230 shares of Common Stock outstanding as of September 30, 2012 and exclude as of that date:

- 2,268,840 shares of Common Stock issuable upon the exercise of stock options outstanding prior to this offering under our stock incentive plans, at a weighted average exercise price of $4.07 per share;
- 2,740,609 shares of Common Stock available for future grants under our stock incentive plans;
- 15,773,297 shares of Common Stock issuable upon the exercise of warrants outstanding, at a weighted average exercise price of $3.18 per share; and
- 1,654,066 restricted stock units issuable upon vesting.

The table above assumes no exercise of outstanding options or warrants prior to this offering or issued but unvested restricted stock units. To the extent that options or warrants are exercised, there will be further dilution to new investors.

To the extent that outstanding options or warrants outstanding as of September 30, 2012 have been or may be exercised or unvested restricted stock units have been or may be issued, investors purchasing our common stock in this offering may experience further dilution. In addition, we may choose to raise additional capital due to market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans. To the extent that we raise additional capital through the sale of equity or convertible debt securities, the issuance of these securities could result in further dilution to our stockholders.

Plan of Distribution

We have entered into an At-the-Market Issuance Sales Agreement, or sales agreement, with MLV & Co. LLC, or MLV, under which we may issue and sell shares of our common stock having aggregate sales proceeds of up to $95,000,000 from time to time through MLV, which will act as our sales agent. MLV may sell the common stock by any method that is deemed to be an "at-the-market" equity offering as defined in Rule 415 promulgated under the Securities Act, including sales made directly on or through The NASDAQ Capital Market or any other existing trading market for the common stock in the United States or to or through a market maker. MLV may also sell the common stock in privately negotiated transactions, subject to our prior approval. No sales will be made on or through the TASE.

Each time we wish to issue and sell common stock under the sales agreement, we will notify MLV of the number of shares to be issued, the dates on which such sales are anticipated to be made and any minimum price below which sales may not be made. Once we have so instructed MLV, unless MLV declines to accept the terms of such notice, MLV has agreed to use its commercially reasonable efforts consistent with its normal trading and sales practices to sell such shares up to the amount specified on such terms. The obligations of MLV under the sales agreement to sell our common stock are subject to a number of customary conditions that we must meet.

Settlement for shares of our common stock will occur on the third trading day following the date on which the sale was made. Sales of our common stock as contemplated in this prospectus supplement will be settled through the facilities of The Depository Trust Company or by such other means as we and MLV may agree upon. There is no arrangement for funds to be received in an escrow, trust or similar arrangement.

We will pay MLV a commission equal to an aggregate of up to 3.0% of the gross proceeds we receive from the sales of our common stock. We also agreed to reimburse MLV for legal expenses incurred by it up to $25,000 in the aggregate. Because there is no minimum offering amount required as a condition to close this offering, the actual total public offering amount, commissions and proceeds to us, if any, are not determinable at this time. In connection with the sale of the common stock on our behalf, MLV will be deemed to be an "underwriter" within the meaning of the Securities Act as amended, and the compensation of MLV will be deemed to be underwriting commissions or discounts. We have agreed to provide indemnification and contribution to MLV with respect to certain civil liabilities, including liabilities under the Securities Act. We estimate that the total expenses for the offering, excluding compensation payable to MLV under the terms of the sales agreement, will be approximately up to $100,000.

The offering of our common stock pursuant to the sales agreement will terminate upon the earlier of (i) the sale of all of our common stock provided for in this prospectus supplement, or (ii) the termination of the sales agreement as permitted therein.

This summary of the material provisions of the sales agreement does not purport to be a complete statement of its terms and conditions. A copy of the sales agreement is filed with the SEC and is incorporated by reference into the registration statement of which this prospectus is a part. See "Where You Can Find More Information" below.

To the extent required by Regulation M under the Exchange Act, MLV will not engage in any market making activities involving our common stock while the offering is ongoing under this prospectus.

MLV and its affiliates may in the future provide various investment banking and other financial services for us and our affiliates, for which services they may in the future receive customary fees.

Legal Matters

The validity of the securities offered hereby will be passed upon for us by Zysman, Aharoni, Gayer and Sullivan & Worcester LLP, New York, New York. LeClairRyan, A Professional Corporation, New York, New York, is acting as counsel for MLV in connection with this offering.

Experts

Our financial statements appearing in our Annual Report on Form 10-K for the fiscal year ended June 30, 2012, have been audited by Kost Forer Gabbay & Kasierer, a member of Ernst & Young Global, independent registered public accounting firm, as set forth in their report thereon included therein, and incorporated by reference in this prospectus supplement and accompanying prospectus. Such financial statements have been included herein in reliance upon such report given on the authority of such firm as experts in accounting and auditing.

Where You Can Find More Information

We file annual, quarterly and current reports, proxy statements and other information with the SEC. You may 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. Please call the SEC at 1-800-SEC-0330 for further information on the public reference room.

The SEC also maintains a website, the address of which is www.sec.gov. That site also contains our annual, quarterly and current reports, proxy statements and other information.

We have filed this prospectus supplement with the SEC as part of a registration statement on Form S-3 under the Securities Act. This prospectus supplement does not contain all of the information set forth in the registration statement because some parts of the registration statement are omitted in accordance with the rules and regulations of the SEC. You can obtain a copy of the registration statement from the SEC at the address listed above or from the SEC's website.

We also maintain a website at www.pluristem.com, through which you can access our SEC filings. The information set forth on our website is not part of this prospectus supplement.

Incorporation on Documents by Reference

We are "incorporating by reference" certain documents we file with the SEC, which means that we can disclose important information to you by referring you to those documents. The information in the documents incorporated by reference is considered to be part of this prospectus supplement. Statements contained in documents that we file with the SEC and that are incorporated by reference in this prospectus supplement will automatically update and supersede information contained in this prospectus supplement, including information in previously filed documents or reports that have been incorporated by reference in this prospectus supplement.

We have filed or may file the following documents with the SEC. These documents are incorporated herein by reference as of their respective dates of filing:

- Our Annual Report on Form 10-K for the fiscal year ended June 30, 2012;
- Our Quarterly Report on Form 10-Q for the fiscal quarter ended September 30, 2012;
- Our Current Reports on Form 8-K filed with the SEC on July 26, 2012, August 6, 2012, August 7, 2012, September 5, 2012, September 14, 2012, September 19, 2012, October 9, 2012, and November 9, 2012; and
- The description of our common stock contained in our Registration Statement on Form 8-A filed with the SEC on December 10, 2007, as amended.

All documents filed by us pursuant to Section 13(a), 13(c), 14 or 15(d) of the Exchange Act until all of the common stock to which this prospectus supplement relates has been sold or the offering is otherwise terminated, except in each case for information contained in any such filing where we indicate that such information is being furnished and is not to be considered "filed" under the Exchange Act, will be deemed to be incorporated by reference in this prospectus supplement and the accompanying prospectus and to be a part hereof from the date of filing of such documents.

We will provide a copy of the documents we incorporate by reference, at no cost, to any person who receives this prospectus supplement. To request a copy of any or all of these documents, you should write or telephone us at MATAM Advanced Technology Park, Building No. 20, Haifa, 31905, Israel, Attention: Yaky Yanay, (+972) 74 710 7171.

PROSPECTUS

$150,000,000

PLURISTEM THERAPEUTICS INC.

Common Stock
Preferred Stock
Warrants
Units

We may from time to time sell common stock, preferred stock and warrants to purchase common stock, and units of two or more of such securities, in one or more offerings for an aggregate initial offering price of $150,000,000. We refer to the common stock, the preferred stock, the warrants to purchase common stock and the units collectively as the securities. This prospectus describes the general manner in which our securities may be offered using this prospectus. We will specify in an accompanying prospectus supplement the terms of the securities to be offered and sold. We may sell these securities to or through underwriters or dealers, directly to purchasers or through agents. We will set forth the names of any underwriters, dealers or agents in an accompanying prospectus supplement.

Our common stock is traded on the NASDAQ Capital Market under the symbol “PSTI.

Investing in our securities involves risks. See “Risk Factors” on page 4 of this prospectus.

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

This prospectus is dated October 20, 2011.

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You should rely only on the information contained in this prospectus and the documents incorporated by reference in this prospectus or to which we have referred you. We have not authorized anyone to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it. This prospectus does not constitute an offer to sell, or a solicitation of an offer to purchase, the securities offered by this prospectus in any jurisdiction to or from any person to whom or from whom it is unlawful to make such offer or solicitation of an offer in such jurisdiction. You should not assume that the information contained in this prospectus or any document incorporated by reference is accurate as of any date other than the date on the front cover of the applicable document. Neither the delivery of this prospectus nor any distribution of securities pursuant to this prospectus shall, under any circumstances, create any implication that there has been no change in the information set forth or incorporated by reference into this prospectus or in our affairs since the date of this prospectus. Our business, financial condition, results of operations and prospects may have changed since that date.

ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement that we filed with the Securities and Exchange Commission, or the SEC, using a “shelf” registration process. Under this shelf registration process, we may, from time to time, sell any combination of the securities described in this prospectus in one or more offerings up to a total dollar amount of $150,000,000. This prospectus describes the securities we may offer and the general manner in which our securities may be offered by this prospectus. Each time we sell securities, we will provide a prospectus supplement that will contain specific information about the terms of that offering. We may also add, update or change in the prospectus supplement any of the information contained in this prospectus. To the extent there is a conflict between the information contained in this prospectus and the prospectus supplement, you should rely on the information in the prospectus supplement, provided that if any statement in one of these documents is inconsistent with a statement in another document having a later date — for example, a document incorporated by reference in this prospectus or any prospectus supplement — the statement in the document having the later date modifies or supersedes the earlier statement.

OUR COMPANY

We are a bio-therapeutic company developing standardized cell therapy products for the treatment of life threatening diseases. We are developing a pipeline of products, stored ready-to-use, derived from human placenta, a non-controversial, non-embryonic, adult cell source. Placental-derived adherent stromal cells are grown in the Company's proprietary PluriX™ three-dimensional process that allows cells to grow in a more natural environment and enable us to produce large quantities of clinical grade cells. We refer to the cells that are grown in the PluriX™ as our PLacental eXpanded cells, or PLX cells. We are expanding our in-house manufacturing capacity so that we will be able to grow large scale quantities of our cells efficiently and without reliance on outside vendors.

Our strategy is to develop and manufacture cell therapy products for the treatment of multiple disorders via several routes of administration. We plan to execute this strategy both independently, using our own personnel and via relationships with research and clinical institutions, or in collaboration with other companies, such as United Therapeutics Corporation, or United. We plan to have in-house manufacturing capacity of clinical grade PLX cells in commercial quantities and to control all of our proprietary manufacturing processes in order to assist in executing this strategy.

We believe that intramuscular administration, which means that the cells are administrated locally to the muscle and not systemically, may be suited for a number of different clinical indications. Such indications include peripheral artery disease, critical limb ischemia, intermittent claudication, muscle injuries, thromboangiitis obliterans, or Buerger's disease, neuropathic pain, wound healing and orthopedic injuries. In addition, we have reported pre-clinical studies utilizing successfully our proprietary PLX cells when administered systemically using an IV in treating multiple sclerosis, ischemic stroke, inflammatory bowel disease and radiation exposure. Under our exclusive license agreement with United Therapeutics, we plan to participate in the development and commercialization of a PLX cell-based product for the treatment of pulmonary arterial hypertension.

Our first product in development, called PLX-PAD, is intended to improve the quality of life of millions of people suffering from peripheral artery disease. On April 13, 2011, following completion of three and six month clinical follow-ups using our PLX cells in , the end-stage of peripheral artery disease, we announced that the data collected from our two open-label, dose-escalation, Phase I clinical trials conducted in the United States and Germany suggests that PLX-PAD is safe, improves quality of life, and is potentially effective in treating patients and reducing amputations.

In January 2011, we successfully completed a parallel scientific advisory process with the European Medicines Agencies (EMA) and the US Food and Drug Administration (FDA) that will allow us to pursue a comprehensive approach towards the treatment of two major components of peripheral artery disease, intermittent claudification and critical limb ischemia, with our placenta-derived PLX cells. The comprehensive clinical plan includes a multinational Phase II study in IC and a multinational Phase II/III pivotal study in critical limb ischemia.

On June 19, 2011, we entered into an exclusive license agreement with United Therapeutics, for the use of our PLX cells to develop and commercialize a cell-based product for the treatment of pulmonary arterial hypertension. The license agreement provides that United Therapeutics will receive exclusive worldwide license rights for the development and commercialization of our PLX cell-based product to treat pulmonary arterial hypertension. The license agreement provides for the following consideration paid or payable to us: (i) $7 million paid to us in August 2011; (ii) up to $37.5 million upon reaching certain regulatory milestones with respect to the development of a product to treat pulmonary arterial hypertension; (iii) reimbursement of up to $10 million of certain of our expenses if we establish a manufacturing facility in North America upon meeting certain milestones; (iv) reimbursement of certain costs in connection with the development of the product; and (v) following commercialization of the product, royalties and the purchase of commercial supplies of the developed product from us at a specified margin over our cost.

Our shares of common stock are traded on the NASDAQ Capital Market under the symbol "PSTI" and on the Tel Aviv Stock Exchange under the symbol “PLTR”.

Our executive offices are located at MATAM Advanced Technology Park, Building No. 20, Haifa, Israel, our telephone number is 011 972 74 710 7171 and our website address is www.pluristem.com. The information on our website is not incorporated by reference in this prospectus and should not be considered to be part of this prospectus. Our website address is included in this prospectus as an inactive technical reference only. Our name and logo and the names of our products are our trademarks or registered trademarks. Unless the context otherwise requires, references in this prospectus to “Pluristem,” “we,” “us,” and “our” refer to Pluristem Therapeutics Inc. and its subsidiary as required by the context.

RISK FACTORS

An investment in our securities involves significant risks. You should carefully consider the risk factors contained in any prospectus supplement and in our filings with the SEC, as well as all of the information contained in this prospectus, any prospectus supplement and the documents incorporated by reference in this prospectus, before you decide to invest in our securities. The risks and uncertainties we have described are not the only ones we face. Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also affect our operations.

SPECIAL NOTE REGARDING FORWARD-LOOKING INFORMATION

This prospectus, any prospectus supplement and the documents we incorporate by reference in this prospectus contain forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995 and other Federal securities laws. All statements, other than statements of historical fact, that we include in this prospectus, any prospectus supplement and in the documents we incorporate by reference in this prospectus, may be deemed forward-looking statements for purposes of the Securities Act of 1933, or the Securities Act, and the Securities Exchange Act of 1934, or the Exchange Act. We use the words "anticipate," "believe," "estimate," "expect," "intend," "may," "plan," "project," "will," "would" and similar expressions to identify forward-looking statements, although not all forward-looking statements contain these identifying words. We cannot guarantee that we actually will achieve the plans, intentions or expectations disclosed in our forward-looking statements and, accordingly, you should not place undue reliance on our forward-looking statements. There are a number of important factors that could cause actual results or events to differ materially from the forward-looking statements that we make, including the factors included in the documents we incorporate by reference in this prospectus. You should read these factors and the other cautionary statements made in the documents we incorporate by reference as being applicable to all related forward-looking statements wherever they appear in this prospectus, any prospectus supplement and any document incorporated by reference. We caution you that, except as otherwise required by law, we do not undertake any obligation to update forward-looking statements we make.

USE OF PROCEEDS

Unless we otherwise indicate in the applicable prospectus supplement, we currently intend to use the net proceeds from the sale of the securities for research and product development activities, clinical trial activities, investment in capital equipment and for working capital and other general corporate purposes.

We may set forth additional information on the use of net proceeds from the sale of securities we offer under this prospectus in a prospectus supplement relating to the specific offering. Pending the application of the net proceeds, we intend to invest the net proceeds in bank deposits or investment-grade, interest-bearing securities subject to any investment policies our investment committee may determine from time to time.

THE SECURITIES WE MAY OFFER

The descriptions of the securities contained in this prospectus, together with the applicable prospectus supplement, summarize the material terms and provisions of the various types of securities that we may offer. We will describe in the applicable prospectus supplement relating to any securities the particular terms of the securities offered by that prospectus supplement. If we so indicate in the applicable prospectus supplement, the terms of the securities may differ from the terms we have summarized below. We may also include in the prospectus supplement information, where applicable, about material United States federal income tax consequences relating to the securities, and the securities exchange or market, if any, on which the securities will be listed.

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

- common stock;
- warrants to purchase common stock;
- preferred stock; and
- units of two or more of the securities mentioned above.

The total initial offering price of all securities that we may issue in these offerings will not exceed $150,000,000.

DESCRIPTION OF CAPITAL STOCK

Our authorized capital stock currently consists of 100,000,000 shares of common stock, of which there were 42,936,719 shares outstanding as of September 25, 2011, and 10,000,000 shares of "blank check" preferred stock, none of which are outstanding. The following statements set forth the material terms of our capital stock; however, reference is made to the more detailed provisions of, and these statements are qualified in their entirety by reference to, our Articles of Incorporation and Bylaws, copies of which are referenced as exhibits herein, and the provisions of Nevada General Corporation Law. There are no provisions in our Articles of Incorporation or Bylaws that would delay, defer or prevent a change in our control.

Common Stock

Except as otherwise required by applicable law and subject to the preferential rights of any outstanding preferred stock, all voting rights are vested in and exercised by the holders of common stock with each share of our common stock being entitled to one vote. In the event of liquidation, holders of the common stock are entitled to share ratably in the distribution of assets remaining after payment of liabilities, if any. Holders of the common stock have no cumulative voting rights and no preemptive or other rights to subscribe for shares. Holders of Common Stock are entitled to such dividends as may be declared by the Board of Directors out of funds legally available therefor.

Blank Check Preferred Stock

Our Board of Directors is empowered, without further action by stockholders, to issue from time to time one or more series of preferred stock, with such designations, rights, preferences and limitations as the Board may determine by resolution. The rights, preferences and limitations of separate series of preferred stock may differ with respect to such matters among such series as may be determined by the Board, including, without limitation, the rate of dividends, method and nature of payment of dividends, terms of redemption, amounts payable on liquidation, sinking fund provisions (if any), conversion rights (if any) and voting rights. Certain issuances of preferred stock may have the effect of delaying or preventing a change in control of our company that some stockholders may believe is not in their interest.

Transfer Agent

American Stock Transfer and Trust Company, LLC is the registrar and transfer agent for our common shares. Their address is 6201 15th Avenue, 2nd Floor, Brooklyn, NY 11219, telephone: (718) 921-8261, (800) 937-5449.

Nevada Anti-Takeover Law and Charter and Bylaws Provisions

Nevada revised statutes sections 78.378 to 78.3793 provide state regulation over the acquisition of a controlling interest in certain Nevada corporations unless the articles of incorporation or bylaws of the corporation provide that the provisions of these sections do not apply. This statute currently does not apply to our Company because in order to be applicable we would have to have as shareholders a specified number of Nevada residents and we would have to do business in Nevada directly or through an affiliate.

DESCRIPTION OF WARRANTS

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

General

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

We will evidence each series of warrants by warrant certificates that we will issue under a separate agreement or by warrant agreements that we will enter into directly with the purchasers of the warrants. If we evidence warrants by warrant certificates, we will enter into a warrant agreement with a warrant agent. We will indicate the name and address of the warrant agent, if any, in the applicable prospectus supplement relating to a particular series of warrants.

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

- the offering price and aggregate number of warrants offered;
- the currency for which the warrants may be purchased or exercised;
- if applicable, the terms of the common stock with which the warrants are issued and the number of warrants issued with such common stock;
- if applicable, the date on and after which the warrants and the related common stock will be separately transferable;
- the number of shares of common stock purchasable upon the exercise of one warrant and the price at which these shares may be purchased upon such exercise;
- the manner in which the warrants may be exercised, which may include by cashless exercise;
- the effect of any merger, consolidation, sale or other disposition of our business on the warrant agreement and the warrants;
- the terms of any rights to redeem or call the warrants;
- any provisions for changes to or adjustments in the exercise price or number of shares of common stock issuable upon exercise of the warrants;
- the dates on which the right to exercise the warrants will commence and expire;
- the manner in which the warrant agreement and warrants may be modified;
- the material United States federal income tax consequences of holding or exercising the warrants;
- the terms of the common stock issuable upon exercise of the warrants; and
- any other specific terms, preferences, rights or limitations of or restrictions on the warrants.

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

Exercise of Warrants

Each warrant will entitle the holder to purchase the number of shares of common stock that we specify in the applicable prospectus supplement at the exercise price that we describe in the applicable prospectus supplement. Unless we otherwise specify in the applicable prospectus supplement, holders of the warrants may exercise the warrants at any time up to 5:00 P.M., Eastern U.S. time, on the expiration date that we set forth in the applicable prospectus supplement. After the close of business on the expiration date, unexercised warrants will become void.

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

Upon receipt of the required payment and the warrant certificate or the warrant agreement, as applicable, properly completed and duly executed at the corporate trust office of the warrant agent, if any, at our offices or at any other office indicated in the applicable prospectus supplement, we will issue and deliver the common stock purchasable upon such exercise. If fewer than all of the warrants represented by the warrant certificate or warrant agreement are exercised, then we will issue a new warrant certificate or warrant agreement for the remaining amount of warrants.

Enforceability of Rights by Holders of Warrants

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

DESCRIPTION OF UNITS

We may issue, in one or more series, units consisting of common stock, preferred stock and/or warrants for the purchase of common stock and/or preferred stock, in any combination. While the terms we have summarized below will apply generally to any units that we may offer under this prospectus, we will describe the particular terms of any series of units in more detail in the applicable prospectus supplement. The terms of any units offered under a prospectus supplement may differ from the terms described below.

We will file as exhibits to a prospectus supplement, or will incorporate by reference from reports that we file with the SEC, the form of unit agreement that describes the terms of the series of units we are offering, and any supplemental agreements, before the issuance of the related series of units. The following summaries of material terms and provisions of the units are subject to, and qualified in their entirety by reference to, all the provisions of the unit agreement and any supplemental agreements applicable to a particular series of units. We urge you to read the applicable prospectus supplement related to the particular series of units that we may offer under this prospectus and the complete unit agreement and any supplemental agreements that contain the terms of the units.

Each unit will be issued so that the holder of the unit is also the holder of each security included in the unit. Thus, the holder of a unit will have the rights and obligations of a holder of each included security. The unit agreement under which a unit is issued may provide that the securities included in the unit may not be held or transferred separately, at any time or at any time before a specified date.

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

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

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

We may issue units in such amounts and in such distinct series as we determine.

PLAN OF DISTRIBUTION

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

- through agents to the public or to investors;
- to one or more underwriters for resale to the public or to investors;
- in “at the market offerings,” within the meaning of Rule 415(a)(4) of the Securities Act, to or through a market maker or into an existing trading market, on an exchange or otherwise;
- directly to investors in privately negotiated transactions;
- directly to a purchaser pursuant to what is known as an "equity line of credit" as described below; or
- through a combination of these methods of sale.

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

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

The accompanying prospectus supplement will describe the terms of the offering of our securities, including:

- the name or names of any agents or underwriters;
- any securities exchange or market on which the common stock may be listed;
- the purchase price and commission, if any, to be paid in connection with the sale of the securities being offered and the proceeds we will receive from the sale;
- any over-allotment options pursuant to which underwriters may purchase additional securities from us;
- any underwriting discounts or agency fees and other items constituting underwriters’ or agents’ compensation;
- any public offering price; and
- any discounts or concessions allowed or reallowed or paid to dealers.

If underwriters are used in the sale, they will acquire the securities for their own account and may resell the securities 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 the sale. The obligations of the underwriters to purchase the securities will be subject to the conditions set forth in the applicable underwriting agreement. We may offer the securities to the public through underwriting syndicates represented by managing underwriters or by underwriters without a syndicate. Subject to certain conditions, the underwriters will be obligated to purchase all the securities offered by the prospectus supplement. We may change from time to time the public offering price and any discounts or concessions allowed or reallowed or paid to dealers.

We may also sell securities pursuant to an "equity line of credit". In such event, we will enter into a common stock purchase agreement with the purchaser to be named therein, which will be described in a Current Report on Form 8-K that we will file with the SEC. In that Form 8-K, we will describe the total amount of securities that we may require the purchaser to purchase under the purchase agreement and the other terms of purchase, and any rights that the purchaser is granted to purchase securities from us. In addition to our issuance of shares of common stock to the equity line purchaser pursuant to the purchase agreement, this prospectus (and the applicable prospectus supplement or post-effective amendment) also covers the resale of those shares from time to time by the equity line purchaser to the public. The equity line purchaser will be considered an "underwriter" within the meaning of Section 2(a)(11) of the Securities Act. Its resales may be effected through a number of methods, including without limitation, ordinary brokerage transactions and transactions in which the broker solicits purchasers and block trades in which the broker or dealer so engaged will attempt to sell the shares as agent, but may position and resell a portion of the block as principal to facilitate the transaction. The equity line purchaser will be bound by various anti-manipulation rules of the SEC and may not, for example, engage in any stabilization activity in connection with its resales of our securities and may not bid for or purchase any of our securities or attempt to induce any person to purchase any of our securities other than as permitted under the Exchange Act.

We may sell our securities directly or through agents we designate from time to time. We will name any agent involved in the offering and sale of our common stock, and we will describe any commissions we will pay the agent in the prospectus supplement. Unless the prospectus supplement states otherwise, our agent will act on a best-efforts basis for the period of its appointment.

We may provide underwriters and agents with indemnification against civil liabilities related to this offering, including liabilities under the Securities Act, or contribution with respect to payments that the underwriters or agents may make with respect to these liabilities. Underwriters and agents may engage in transactions with, or perform services for, us in the ordinary course of business. We will describe such relationships in the prospectus supplement naming the underwriter or agent and the nature of any such relationship.

Rules of the SEC may limit the ability of any underwriters to bid for or purchase securities before the distribution of the shares of common stock is completed. However, underwriters may engage in the following activities in accordance with the rules:

- *Stabilizing transactions* — Underwriters may make bids or purchases for the purpose of pegging, fixing or maintaining the price of the shares, so long as stabilizing bids do not exceed a specified maximum.

- *Over-allotments and syndicate covering transactions* — Underwriters may sell more shares of our common stock than the number of shares that they have committed to purchase in any underwritten offering. This over-allotment creates a short position for the underwriters. This short position may involve either "covered" short sales or "naked" short sales. Covered short sales are short sales made in an amount not greater than the underwriters' over-allotment option to purchase additional shares in any underwritten offering. The underwriters may close out any covered short position either by exercising their over-allotment option or by purchasing shares in the open market. To determine how they will close 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 over-allotment option. Naked short sales are short sales in excess of the over-allotment option. The underwriters must close out any naked position by purchasing shares in the open market. A naked short position is more likely to be created if the underwriters are concerned that, in the open market after pricing, there may be downward pressure on the price of the shares that could adversely affect investors who purchase shares in the offering.

- *Penalty bids* — If underwriters purchase shares in the open market in a stabilizing transaction or syndicate covering transaction, they may reclaim a selling concession from other underwriters and selling group members who sold those shares as part of the offering.

Similar to other purchase transactions, an underwriter's purchases to cover the syndicate short sales or to stabilize the market price of our common stock may have the effect of raising or maintaining the market price of our common stock or preventing or mitigating a decline in the market price of our common stock. As a result, the price of the shares of our common stock may be higher than the price that might otherwise exist in the open market. The imposition of a penalty bid might also have an effect on the price of shares if it discourages resales of the shares.

If commenced, the underwriters may discontinue any of these activities at any time.

Our common stock is traded on the NASDAQ Capital Market and on the Tel Aviv Stock Exchange. One or more underwriters may make a market in our common stock, but the underwriters will not be obligated to do so and may discontinue market making at any time without notice. We cannot give any assurance as to liquidity of the trading market for our common stock.

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

In compliance with guidelines of the Financial Industry Regulatory Authority, or FINRA, the maximum commission or discount to be received by any FINRA member or independent broker dealer may not exceed 8% of the aggregate amount of the securities offered pursuant to this prospectus and any applicable prospectus supplement.

VALIDITY OF THE SECURITIES

The validity of the securities offered hereby will be passed upon for us by Zysman, Aharoni, Gayer and Sullivan & Worcester, LLP, Boston, Massachusetts.

EXPERTS

The financial statements of Pluristem Therapeutics Inc. appearing in Pluristem Therapeutics Inc.'s Annual Report (Form 10-K) for the fiscal year ended June 30, 2011, have been audited by Kost Forer Gabbay & Kasierer, a member of Ernst & Young Global, independent registered public accounting firm, as set forth in their report thereon, included therein, and incorporated herein by reference. Such financial statements are incorporated herein by reference in reliance upon such report given on the authority of such firm as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We file reports, proxy statements and other documents with the SEC. You may 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. Please call the SEC at 1-800-SEC-0330 for further information on the public reference room.

The SEC also maintains a website, the address of which is www.sec.gov. That site also contains our annual, quarterly and current reports, proxy statements, information statements and other information.

We have filed this prospectus with the SEC as part of a registration statement on Form S-3 under the Securities Act. This prospectus does not contain all of the information set forth in the registration statement because some parts of the registration statement are omitted in accordance with the rules and regulations of the SEC. You can obtain a copy of the registration statement from the SEC at the address listed above or from the SEC's website.

We also maintain a website at www.pluristem.com, through which you can access our SEC filings. The information set forth on our website and on the SEC's website is not part of this prospectus.

INCORPORATION OF DOCUMENTS BY REFERENCE

We are "incorporating by reference" certain documents we file with the SEC, which means that we can disclose important information to you by referring you to those documents. The information in the documents incorporated by reference is considered to be part of this prospectus. Statements contained in documents that we file with the SEC and that are incorporated by reference in this prospectus will automatically update and supersede information contained in this prospectus, including information in previously filed documents or reports that have been incorporated by reference in this prospectus, to the extent the new information differs from or is inconsistent with the old information.

We have filed or may file the following documents with the SEC. These documents are incorporated herein by reference as of their respective dates of filing:

- Our Annual Report on Form 10-K for the fiscal year ended June 30, 2011;
- Our Current Report on Form 8-K, as filed with the SEC on July 28, 2011;
- Our Current Report on Form 8-K, as filed with the SEC on August 3, 2011;
- Our Current Report on Form 8-K, as filed with the SEC on August 25, 2011;
- Our Current Report on Form 8-K, as filed with the SEC on September 15, 2011; and
- The description of our common stock contained in our Registration Statement on Form 8-A filed with the SEC on December 10, 2007, as amended.

All documents filed by us pursuant to Section 13(a), 13(c), 14 or 15(d) of the Exchange Act until all of the common stock to which this prospectus relates has been sold or the offering is otherwise terminated, except in each case for information contained in any such filing where we indicate that such information is being furnished and is not to be considered "filed" under the Exchange Act, will be deemed to be incorporated by reference in this prospectus and the accompanying prospectus supplement and to be a part hereof from the date of filing of such documents.

We will provide a copy of the documents we incorporate by reference, at no cost, to any person who receives this prospectus. To request a copy of any or all of these documents, you should write or telephone us at MATAM Advanced Technology Park, Building No. 20, Haifa, 31905, Israel, Attention: Yaky Yanay, (+972) 74 710 7171.

$95,000,000 Common Stock

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PROSPECTUS SUPPLEMENT

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December 26, 2012