PLURISTEM THERAPEUTICS INC
Form 424B5
September 12, 2012

The information in this preliminary prospectus supplement and the accompanying prospectus is not complete and may be changed. A registration statement relating to these securities has been declared effective by the Securities and Exchange Commission. This preliminary prospectus supplement and the accompanying prospectus are not an offer to sell these securities and we are not soliciting an offer to buy these securities in any state or jurisdiction where the offer or sale is not permitted.

SUBJECT TO COMPLETION, DATED SEPTEMBER 12, 2012

PRELIMINARY PROSPECTUS SUPPLEMENT
(to prospectus dated October 20, 2011)

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

Shares of Common Stock

and Warrants to purchase _____ Shares of Common Stock

Pluristem Therapeutics Inc. is offering up to [•] shares of its common stock and warrants to purchase up to shares of its common stock at an exercise price of $[•] per share of common stock. The shares of common stock and warrants will be sold in units, with each unit consisting of one share of common stock and a warrant to purchase [•] shares of common stock, with the shares of common stock and warrants immediately separable upon issuance. Each unit will be sold at a price of $[•] per unit.

Our common stock is listed on The NASDAQ Capital Market under the symbol “PSTI.” On September [•], 2012, the last reported sale price of our common stock on The NASDAQ Capital Market was $[•] per share. Our common stock is also listed on the Tel Aviv Stock Exchange under the symbol “PLTR.”

This prospectus supplement is not complete without, and may not be utilized except in connection with, the accompanying prospectus dated October 20, 2011. Further, we incorporate important information into this prospectus supplement and the accompanying prospectus by reference.

There is no market through which the warrants may be sold and purchasers may not be able to resell the warrants purchased under this prospectus supplement. This may affect the pricing of the warrants in the secondary market, the transparency and availability of trading prices, the liquidity of such warrants, and the extent of issuer regulation. See “Risk Factors.”

Investing in our securities involves a high degree of risk. See the "Risk Factors" section beginning on page S-[•] 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.

	PER UNIT	TOTAL
Public offering price	$	$
Underwriting discounts and commissions	$	$
Offering proceeds to Pluristem before expenses	$	$

Delivery of the units is expected to be made on or about September , 2012. We have granted the underwriters an option for a period of 30 days to purchase up to additional shares of common stock and/or additional warrants to purchase up to shares of common stock to cover over-allotments, if any. If the underwriters exercise the option in full, the total underwriting discounts and commissions payable by us will be $, and the total proceeds to us, before expenses, will be $.

Sole Book-Running Manager

Jefferies

Co-Lead Manager

Oppenheimer & Co.

Co-Managers

Needham & Company

Maxim Group LLC

Prospectus Supplement dated September , 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 (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 up to an aggregate of $150 million of our common stock, preferred stock, warrants and units. We have not yet sold any securities under the foregoing shelf registration.

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 warrants to purchase 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 the underwriters have 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," "u 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.

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- [•] 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 stem 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 stem cells are grown in our proprietary PluriX™ three-dimensional process that allows cells to grow in a natural environment and enables 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 through relationships with research and clinical institutions or in collaboration with other companies, such as United Therapeutics Corporation. 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, or IM, 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, orthopedic injuries, bone marrow diseases and acute radiation syndrome. In addition, we have reported successful pre-clinical studies utilizing our PLX cells when administered systemically by an intravenous, or IV, in treating multiple sclerosis, ischemic stroke, inflammatory bowel disease, acute myocardial infraction, diabetic diastolic heart failure, interstitial lung disease and radiation exposure. Under our exclusive license agreement with United Therapeutics, or the United Agreement, we plan to participate in the development and commercialization of a PLX cell-based product for the treatment of pulmonary arterial hypertension.

Recent Developments

Clinical Activities

A seven year old girl suffering from aplastic bone marrow disease was given two doses of PLX cells intramuscularly in a compassionate use situation. Approximately 10 days following the last administration of PLX cells, which took place on March 28, 2012, the patient's hematological parameters began to significantly improve. We believe that this clinical result suggests that PLX cells may be effective in supporting bone marrow transplantation and in treating bone marrow suppression from radiation and chemotherapy. Additionally, this case suggests that PLX cells administered locally into skeletal muscle may have efficacious systemic effects. The treatment was made under the

Israeli government's compassionate use program.

On August 6, 2012, we announced that the injection of PLX cells in a patient suffering from bone marrow failure in which there was a dangerous reduction in the number of red blood cells, white blood cells, and platelets (pancytopenia) caused an improvement in her clinical condition leading to her discharge from the hospital. The treatment was made under the Israeli government's compassionate use program.

On September 5, 2012, we announced that our PLX cells were administered to a third patient suffering from Acute Myeloid Leukemia in Hadassah Medical Center and his clinical condition improved, resulting in his release from the hospital. The treatment was made under the Israeli government's compassionate use program.

In March 2012, we submitted an investigational new drug application, or IND, to the FDA for the use of PLX-PAD to treat intermittent claudication, a form of peripheral artery disease. We initiated a Phase II clinical trial using PLX-PAD intramuscularly for the treatment of intermittent claudication in September 2012. The trial will evaluate the safety and efficacy of two different doses of PLX-PAD compared to a placebo administered via one or two intramuscular injections. The study will be conducted at several leading U.S. clinical sites.

On August 7, 2012 we announced that we received approval from the Paul-Ehrlich-Institute, the medical regulatory body in Germany, to commence a Phase I/II randomized, double blind, placebo controlled study to assess the safety and efficacy of PLX cells, through intramuscular injections, for the regeneration of injured gluteal musculature following total hip replacement.

Pre-Clinical Activities

We recently announced the results of two pre-clinical studies using our PLX cells in animals for the treatment of acute myocardial infarction and diabetic diastolic heart failure. In the heart attack study, PLX cells reduced the area of infarction and improved cardiac hemodynamic parameters. In the diabetic diastolic heart failure study, conducted under the European Commission's Seventh Framework Program (FP7) Collaboration, data suggest that cardiac function in animals with diabetic-induced diastolic dysfunctional heart failure improved following the administration of PLX cells.

On June 19, 2012, we announced the completion of a pre-clinical study measuring the effectiveness of our PLX cells when administered intramuscularly in animals whose bone marrow had been previously irradiated. This approach may produce systemic benefits for a number of hematological disorders, as well as primary and secondary bone marrow failure, such as in radiation sickness and possibly for some complications from chemotherapy and radiotherapy.

On July 26, 2012, we announced an invitation from the U.S. National Institute of Allergy and Infectious Diseases to submit our PLX cells to the Institute for evaluation in models of hematopoietic and gastrointestinal acute radiation syndrome.

On July 31, 2012, we also announced the results of new pre-clinical studies in animals that show that PLX cells may be effective in reducing pulmonary fibrosis and improving lung function in a group of diseases collectively called interstitial lung disease.

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

Shares of common stock and warrants offered	[•] shares and warrants to purchase up to [•] shares of common stock. This prospectus also covers up to [•] shares of common stock issuable upon exercise of the warrants.
Offering price per unit	$
Terms of warrants	An exercise price of $ per share exercisable on and expiring on , 20 , the anniversary of the date of the issuance.
Common stock outstanding prior to this offering	47,456,785 shares
Common stock to be outstanding after this offering	[•] shares or [•] shares if all of the warrants are exercised
Use of proceeds	We estimate that the net proceeds from this offering, after deducting underwriting discounts and commissions and offering expenses payable by us, will be approximately $. We intend to use the net proceeds from this offering 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- [•].
Risk factors	See “Risk Factors” beginning on page S- [•] 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.
Lock-up	Subject to certain exceptions, we and our executive officers and directors have agreed with the underwriters not to sell, transfer or dispose of any shares of our common stock for a period of 90 days after the date of this prospectus supplement. See “Underwriting” on page S- [•].
NASDAQ Capital Market symbol	PSTI

Unless otherwise stated, all information in this prospectus supplement is based on 47,456,785 shares of common stock outstanding as of September 5, 2012, assumes no exercise of the underwriters’ over-allotment option, and does not include the following:

- 2,293,840 shares issuable upon the exercise of stock options outstanding prior to this offering under our stock incentive plans, at a weighted average exercise price of $4.06 per share;

742,471 shares available for future grants under our stock incentive plans;

12,955,500 shares issuable upon the exercise of warrants outstanding prior to this offering, at a weighted average exercise price of $2.69 per share; and

1,898,948 restricted stock units issuable upon vesting.

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 and must be considered in the development stage. 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 eighteen 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 thirteen pending U.S. patent applications and seventy pending non-U.S. patent applications (including three 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 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 results are therefore highly uncertain if we will be able to obtain protection in 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 pursue 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 these 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 have shown promising results, and our stock price has arisen after 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. 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 will pay a substantially higher price than the book value of our shares.

If you purchase shares in this offering, you will incur an immediate and substantial dilution in net tangible book value of ___ per share, assuming the sale by us of all shares offered hereby at an assumed price to the public of per share (based on the closing price on The NASDAQ Capital Market on September [__], 2012).

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

We have issued 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 or registration 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.

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 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 discuss how the results of specific cases demonstrate that PLX cells could potentially be effective in cancer patients who receive severe radiation and chemotherapy treatments, severely damaging their bone marrow, when we discuss how PLX cells could potentially assist in the recovery of bone marrow following bone marrow transplant poor engraftment or other conditions where the bone marrow is significantly compromised, when we discuss the bone marrow transplant market in the U.S, when we say that data from two Phase I clinical trials indicate that our first PLX product, PLX-PAD, is safe and potentially effective for the treatment of end stage PAD or when we say that our pre-clinical animal models have demonstrated PLX cells are also potentially effective in other inflammatory/ischemic indications, including diastolic heart failure, inflammatory bowel disease, neuropathic pain and pulmonary fibrosis. We cannot guarantee that we actually will achieve the plans, intentions or expectations and conduct the clinical studies disclosed in our forward-looking statements, achieving success in such studies, enter into collaboration with other companies and 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.

Use of Proceeds

We estimate that the net proceeds from this offering will be approximately $ million at a public offering price of $ per share after deducting underwriting discounts and commissions and estimated offering expenses payable by us. If the underwriters’ over-allotment option is exercised in full, we estimate that we will receive net proceeds of approximately $ million, after deducting underwriting discounts and commissions and estimated offering expenses payable by us. This amount does not include the proceeds which we may receive in connection with the exercise of the warrants.

We intend to use the net proceeds from this offering 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.

Price Range of Common Stock

Our shares of common stock are listed on The NASDAQ Capital Market under the symbol “PSTI”.

The following table sets forth, for the periods indicated, the high and low sales prices of our common stock, as reported on NASDAQ.

Calendar Quarter	High	Low
2012		
First quarter	$ 2.77	$ 2.09
Second quarter	$ 2.86	$ 2.16
Third quarter (through September 6)	$ 4.75	$ 2.38
2011		
First quarter	$ 4.20	$ 1.54
Second quarter	$ 3.15	$ 2.56
Third quarter	$ 3.65	$ 2.03
Fourth quarter	$ 2.86	$ 2.05
2010		
First quarter	$ 1.27	$ 1.06
Second quarter	$ 1.32	$ 1.01
Third quarter	$ 1.62	$ 1.01
Fourth quarter	$ 1.64	$ 1.24

On September [•], 2012, the last reported sale price of our common stock on The NASDAQ Capital Market was $[•] per share.

Dividend Policy

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

Capitalization

The following table sets forth our consolidated capitalization as of June 30, 2012:

on an actual basis; and

on an as adjusted basis to give effect to our sale of the shares of common stock offered hereby at an assumed public offering price of $ [•] per share, after deducting underwriting discounts and commissions and estimated offering expenses payable by us (assuming no exercise of the underwriters' over-allotment option).

The information set forth in the following table should be read in conjunction with and is qualified in its entirety by reference to the audited and unaudited financial statements and notes thereto incorporated by reference in this prospectus supplement and the accompanying prospectus.

	As of June 30, 2012	
(In thousands, except share data)	Actual (unaudited)	As Adjusted
Shareholders' equity:		
Common stock, par value $0.00001 per share – authorized 100,000,000 shares; 46,448,051 shares issued and outstanding; [•] shares outstanding on an as adjusted basis (1)	$	$
Preferred stock, par value $0.00001 per share – authorized 10,000,000 shares; none issued and outstanding.	–	–
Additional paid-in capital (through June 30, 2012)	103,619	
Accumulated deficit (through June 30, 2012)	65,747	
Other comprehensive loss	130	$
Total shareholders' equity	$ 37,742	$

(1) Based on 46,448,051 shares outstanding as of June 30, 2012. This number does not include:

2,358,172 shares issuable upon the exercise of stock options outstanding prior to this offering under our stock incentive plans, at a weighted average exercise price of $3.98 per share;

823,430 shares available for future grants under our stock incentive plans;

13,750,968 shares issuable upon the exercise of warrants outstanding prior to this offering, at a weighted average exercise price of $2.62 per share; and

2,151,276 restricted stock units issuable upon vesting.

Dilution

If you purchase shares of our common stock in this offering (either as a component of units or upon warrant exercise), 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 June 30, 2012, was approximately $37.7 million, or approximately $0.81 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. Unless otherwise noted, all information contained in this dilution section assumes that the underwriters do not exercise their over-allotment option.

After giving effect to the sale of shares of common stock in this offering at an assumed public offering price of $ [•] per share (which is the closing price of our stock on The NASDAQ Capital Market on September [•], 2012) and after deducting underwriting discounts and commissions and estimated offering expenses, our net tangible book value as of that date would have been $ [•] million, or $ [•] per share. This amount represents an immediate increase in net tangible book value to existing shareholders of $ [•] per share and an immediate dilution in net tangible book value of $ [•] per share to purchasers of our shares of common stock in this offering, as illustrated in the following table (without giving effect to the over-allotment option granted to the underwriters):

Assumed public offering price per share		$
Net tangible book value per share as of June 30, 2012	$0.81	
Increase in net tangible book value per share after giving effect to this offering	$	
Pro forma net tangible book value per share as of June 30, 2012		$
Dilution in net tangible book value per share to new investors		$

If the underwriters exercise in full their option to purchase up to additional units at the public offering price of $ per share, the as adjusted net tangible book value as of June 30, 2012 after this offering would have been $ per share, representing an increase in net tangible book value of $ per share to existing stockholders and immediate dilution in net tangible book value of $ per share to investors purchasing our common stock in this offering at the public offering price.

The foregoing per share dilution does not give effect to the potential exercise of the warrants offered hereby. Assuming the sale of all securities offered hereby and also the exercise of all warrants offered hereby, the per share dilution would be as follows:

After giving effect to the sale of shares of common stock in this offering (inclusive of the warrant shares) at an assumed public offering price of $ [•] per share, and assuming an exercise price of $ [•] per warrant share, both prices are the closing price of our shares on the NASDAQ Capital Market on September [•], 2012, and after deducting underwriting discounts and commissions and estimated offering expenses, our net tangible book value as of June 30, 2012, would have been $ [•], or $ [•] per share. This amount represents an immediate increase in net tangible book value to existing shareholders of $ [•] per share and an immediate dilution in net tangible book value of $ [•] per share to purchasers of our shares of common stock in this offering, as illustrated in the following table (without giving effect to the over-allotment option granted to the underwriters):

Assumed public offering price per share		$
Net tangible book value per share as of June 30, 2012	$0.81	
Increase in net tangible book value per share after giving effect to this offering	$	

Pro forma net tangible book value per share as of June 30, 2012	$
Dilution in net tangible book value per share to new investors	$

The discussion and tables above are based on 46,448,051 shares outstanding as of June 30, 2012 and excludes as of that date:

- 2,358,172 shares issuable upon the exercise of stock options outstanding prior to this offering under our stock incentive plans, at a weighted average exercise price of $3.98 per share;
- 823,430 shares available for future grants under our stock incentive plans;
- 13,750,968 shares issuable upon the exercise of warrants outstanding prior to this offering, at a weighted average exercise price of $2.62 per share; and
- 2,151,276 restricted stock units issuable upon vesting.

This tables above assume 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 June 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.

Underwriting

Subject to the terms and conditions set forth in the underwriting agreement dated on or about September , 2012, between us and the underwriters named below, we have agreed to sell to the underwriters and the underwriters have severally agreed to purchase from us the number of units indicated in the table below:

Underwriters	Number of Units
Jefferies & Company, Inc.	
Oppenheimer & Co. Inc.	
Needham & Company, LLC	
Maxim Group LLC	
Total	

Jefferies & Company, Inc. is acting as sole book-running manager of this offering and as representative of the underwriters named above.

The underwriting agreement provides that the obligations of the several underwriters are subject to certain conditions precedent such as the receipt by the underwriters of officers' certificates and legal opinions and approval of certain legal matters by their counsel. The underwriting agreement provides that the underwriters will purchase all of the units if any of them 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 and certain of their controlling persons against certain liabilities, including liabilities under the Securities Act, and to contribute to payments that the underwriters may be required to make in respect of those liabilities.

The shares of common stock and warrants will be sold in units, with each unit consisting of one share of common stock and a warrant to purchase [•] shares of common stock, with the shares of common stock and warrants immediately separable upon issuance. There is no market through which the warrants may be sold and purchasers may not be able to resell the warrants purchased under this prospectus supplement. The underwriters have advised us that they currently intend to make a market in the shares of common stock. However, the underwriters are not obligated to do so and may discontinue any market-making activities at any time without notice. No assurance can be given as to the liquidity of the trading market for the shares of common stock.

The underwriters are offering the units subject to their acceptance of the units from us and subject to prior sale. The underwriters reserve the right to withdraw, cancel or modify offers to the public and to reject orders in whole or in part.

We expect to deliver the units against payment for the shares on or about the date specified on the cover page of this prospectus, which will be the fourth business day following the date of the pricing of the units (such settlement being referred to as "T+4"). Under Rule 15c6-1 under the Exchange Act, trades in the secondary market are required to settle in three business days, unless the parties to such trade expressly agree otherwise. Accordingly, purchasers who wish to trade the shares of common stock prior to the date that is three business days preceding the settlement date will be required, by virtue of the fact that the shares of common stock initially settle in T+4, to specify alternate settlement arrangements at the time of any such trade to prevent a failed settlement. Purchasers of the shares of common stock who wish to trade the shares of common stock during such period should consult their advisors.

Commission and Expenses

The underwriters have advised us that they propose to offer the units to the public at the public offering price set forth on the cover page of this prospectus supplement and to certain dealers at that price less a concession not in excess of $ per unit. The underwriters may allow, and certain dealers may reallow, a discount from the concession not in excess of $ per unit to certain brokers and dealers. After the offering, the public offering price, concession and reallowance to dealers may be reduced by the representative. No such reduction will change the amount of proceeds to be received by us as set forth on the cover page of this prospectus supplement.

The following table shows the public offering price, the underwriting discounts and commissions that we are to pay the underwriters and the proceeds, before expenses, to us in connection with this offering. Such amounts are shown assuming both no exercise and full exercise of the underwriters' option to purchase additional units.

	Per Unit		Total	
	Without Option to Purchase Additional Units	With Option to Purchase Additional Units	Without Option to Purchase Units	With Option to Purchase Additional Units
Public offering price	$	$	$	$
Underwriting discounts and commissions paid by us	$	$	$	$
Proceeds to us, before expenses	$	$	$	$

We estimate expenses payable by us in connection with this offering, other than the underwriting discounts and commissions referred to above, will be approximately $.

Rothschild Inc. ("Rothschild") has acted as our financial advisor in connection with this offering. Rothschild is not acting as an underwriter in connection with this offering, and accordingly, it is neither purchasing securities nor offering securities to the public in connection with this offering. The expenses of this offering include a fee to be paid to Rothschild for services rendered as our financial advisor in connection with this offering. Leader Underwriters (1993) Ltd. ("Leader") has acted as our financial advisor in Israel in connection with this offering. The expenses of this offering include a fee to be paid to Leader for services rendered as our financial advisor in connection with this offering.

Listing

Our shares of common stock are listed on The NASDAQ Capital Market under the trading symbol "PSTI" and on the Tel Aviv Stock Exchange under the ticker symbol "PLTR".

Option to Purchase Additional Shares

We have granted the underwriters an option to purchase up to additional shares of common stock and/or warrants to purchase up to shares of common stock from us, and with the same underwriting discount, as set forth in the table above. The underwriters may exercise this option at any time and from time to time during the 30-day period from the date of this prospectus supplement to cover over-allotments, if any. To the extent any shares and/or warrants are purchased with this over-allotment option, the underwriters will purchase shares and/or warrants in approximately the same proportion as shown in the table above. The representatives, in their sole discretion, shall determine the allocation and distribution of the option shares/warrants.

No Sales of Similar Securities

We and each of our executive officers and directors have agreed, subject to specified exceptions, not to directly or indirectly:

- sell, offer, contract or grant any option to sell (including any short sale), pledge, transfer, establish an open "put equivalent position" within the meaning of Rule 16a-l(h) under the Exchange Act, or

otherwise dispose of any shares of common stock, options or warrants to acquire common stock, or securities exchangeable or exercisable for or convertible into common stock currently or hereafter owned either of record or beneficially, or

publicly announce an intention to do any of the foregoing for a period of 90 days after the date of this prospectus supplement without the prior written consent of Jefferies & Company, Inc.

These restrictions terminate after the close of trading of the common stock on and including the 90th day after the date of this prospectus supplement. However, subject to certain exceptions, in the event that either:

during the last 17 days of the 90-day restricted period, we issue an earnings release or material news or a material event relating to us occurs, or

prior to the expiration of the 90-day restricted period, we announce that we will release earnings results during the 16-day period beginning on the last day of the 90-day restricted period,

then in either case the expiration of the 90-day restricted period will be extended until the expiration of the 18-day period beginning on the date of the issuance of an earnings release or the occurrence of the material news or event, as applicable, unless Jefferies & Company, Inc. waives, in writing, such an extension.

Jefferies & Company, Inc. may, in its sole discretion and at any time or from time to time before the termination of the 90-day period, without public notice, release all or any portion of the securities subject to lock-up agreements. There are no existing agreements between the underwriters and any of our stockholders who will execute a lock-up agreement, providing consent to the sale of shares prior to the expiration of the lock-up period.

Stabilization

The underwriters have advised us that, pursuant to Regulation M under the Exchange Act, certain persons participating in the offering may engage in transactions, including overallotment, stabilizing bids, syndicate covering transactions or the imposition of penalty bids, which may have the effect of stabilizing or maintaining the market price of the shares of common stock at a level above that which might otherwise prevail in the open market. Overallotment involves syndicate sales in excess of the offering size, which creates a syndicate short position. Establishing short sales positions may involve either “covered” short sales or “naked” short sales.

“Covered” short sales are sales made in an amount not greater than the underwriters’ option to purchase additional shares of our common stock in this offering. The underwriters may close out any covered short position by either exercising their option to purchase additional shares of our common stock or purchasing shares of our common stock 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 of common stock available for purchase in the open market as compared to the price at which they may purchase shares through the option to purchase additional shares.

“Naked” short sales are sales in excess of the option to purchase additional shares of our common stock. The underwriters must close out any naked short position by purchasing shares of common stock in the open market. A naked short position is more likely to be created if the underwriters are concerned that there may be downward pressure on the price of the shares of our common stock in the open market after pricing that could adversely affect investors who purchase in this offering.

A stabilizing bid is a bid for the purchase of common stock on behalf of the underwriters for the purpose of fixing or maintaining the price of the common stock. A syndicate covering transaction is the bid for or the purchase of common stock on behalf of the underwriters to reduce a short position incurred by the underwriters in connection with 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. A penalty bid is an arrangement permitting the underwriters to reclaim the selling concession otherwise accruing to a syndicate member in connection with the offering if the common stock originally sold by such syndicate member are purchased in a syndicate covering transaction and therefore have not

been effectively placed by such syndicate member.

Neither we nor any of the underwriters 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 our common stock. The underwriters are not obligated to engage in these activities and, if commenced, any of the activities may be discontinued at any time.

The underwriters may also engage in passive market making transactions in our common stock on The NASDAQ Capital Market in accordance with Rule 103 of Regulation M during a period before the commencement of offers or sales of shares of our common stock in this offering 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.

Electronic Distribution

This prospectus supplement and the accompanying prospectus in electronic format may be made available by e-mail or on the web sites or through online services maintained by one or more of the underwriters or their affiliates. In those cases, prospective investors may view offering terms online and may be allowed to place orders online. The underwriters may agree with us to allocate a specific number of units for sale to online brokerage account holders. Any such allocation for online distributions will be made by the underwriters on the same basis as other allocations. Other than this prospectus supplement and the accompanying prospectus in electronic format, the information on the underwriters' web sites and any information contained in any other web site maintained by any of the underwriters is not part of this prospectus supplement or the accompanying prospectus, has not been approved and/or endorsed by us or the underwriters and should not be relied upon by investors.

Affiliations

The underwriters and certain of their affiliates are full-service financial institutions engaged in various activities, which may include securities trading, commercial and investment banking, financial advisory, investment management, investment research, principal investment, hedging, financing and brokerage activities. The underwriters and certain of their affiliates have, from time to time, performed, and may in the future perform, various financial advisory and investment banking services for us, for which they received or will receive customary fees and expenses.

In the ordinary course of their various business activities, the underwriters and certain of 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, and such investment and securities activities may involve our securities and/or instruments. The underwriters and certain of their affiliates may also make investment recommendations and/or publish or express independent research views in respect of such securities or instruments and may at any time hold, or recommend to clients that they acquire, long and/or short positions in such securities and instruments.

Notice to Non-U.S. Investors

Australia

This prospectus supplement and the accompanying prospectus are not a disclosure document for the purposes of Australia's Corporations Act 2001 (Cth) of Australia, or Corporations Act, has not been lodged with the Australian Securities & Investments Commission and is only directed to the categories of exempt persons set out below. Accordingly, if you receive this prospectus supplement and the accompanying prospectus in Australia:

A. You confirm and warrant that you are either:

- a "sophisticated investor" under section 708(8)(a) or (b) of the Corporations Act;
- a "sophisticated investor" under section 708(8)(c) or (d) of the Corporations Act and that you have provided an accountant's certificate to the company which complies with the requirements of section 708(8)(c)(i) or (ii) of the Corporations Act and related regulations before the offer has been made;
- "professional investor" within the meaning of section 708(11)(a) or (b) of the Corporations Act.

To the extent that you are unable to confirm or warrant that you are an exempt sophisticated investor or professional investor under the Corporations Act any offer made to you under this prospectus supplement and the accompanying

prospectus is void and incapable of acceptance.

B. You warrant and agree that you will not offer any of the securities issued to you pursuant to this prospectus supplement and the accompanying prospectus for resale in Australia within 12 months of those shares being issued unless any such resale offer is exempt from the requirement to issue a disclosure document under section 708 of the Corporations Act.

European Economic Area

In relation to each member state of the European Economic Area which has implemented the Prospectus Directive (each, a "Relevant Member State"), an offer to the public of any common shares which are the subject of the offering contemplated by this prospectus supplement and the accompanying prospectus may not be made in that Relevant Member State except that an offer to the public in that Relevant Member State of any common shares may be made at any time under the following exemptions under the Prospectus Directive, if they have been implemented in that Relevant Member State:

(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 underwriters or the underwriters nominated by us for any such offer; or

(c) in any other circumstances falling within Article 3(2) of the Prospectus Directive, provided that no such offer of common shares shall require us or any of the underwriters to publish a prospectus pursuant to Article 3 of the Prospectus Directive or supplement a prospectus pursuant to Article 16 of the Prospectus Directive.

For the purposes of this provision, the expression an "offer common shares to the public" in relation to the common 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 common shares to be offered so as to enable an investor to decide to purchase or subscribe to the common shares, as the same may be varied in that Relevant Member State by any measure implementing the Prospectus Directive in that Relevant Member State and the expression "Prospectus Directive" means Directive 2003/71/EC (and amendments thereto, including the 2010 PD Amending Directive, to the extent implemented in the Relevant Member State), and includes any relevant implementing measure in the Relevant Member State and the expression "2010 PD Amending Directive" means Directive 2010/73/EU.

Switzerland

Our securities may not be publicly offered in Switzerland and will not be listed on the SIX Swiss Exchange, or 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 securities 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 Issuer, the securities 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 securities will not be supervised by, the Swiss Financial Market Supervisory Authority FINMA and the offer of securities has not been and will not be authorized under the Swiss Federal Act on Collective Investment Schemes, or CISA. The investor protection afforded to acquirers of interests in collective investment schemes under the CISA does not extend to acquirers of shares of our securities.

United Kingdom

This prospectus supplement and the accompanying prospectus are only being distributed to, and are only directed at, persons in the United Kingdom that are qualified investors within the meaning of Article 2(1)(e) of the Prospectus Directive that are also (i) investment professionals falling within Article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005, as amended (the "Order") and/or (ii) high net worth entities falling within Article 49(2)(a) to (d) of the Order and other persons to whom it may lawfully be communicated (each such person being referred to as a "relevant person").

This prospectus supplement and the accompanying prospectus and its contents are confidential and should not be distributed, published or reproduced (in whole or in part) or disclosed by recipients to any other persons in the United Kingdom. Any person in the United Kingdom that is not a relevant person should not act or rely on this document or any of its contents.

Hong Kong

No securities have been offered or sold, and no securities may be offered or sold, in Hong Kong, by means of any document, other than to persons whose ordinary business is to buy or sell shares or debentures, whether as principal or agent; or to "professional investors" as defined in the Securities and Futures Ordinance (Cap. 571) of Hong Kong and any rules made under that Ordinance; or 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 the Companies Ordinance (Cap.32) of Hong Kong. No document, invitation or advertisement relating to the securities has been issued or may be issued or may be in the possession of any person for the purpose of issue (in each case 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 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 (Cap. 571) of Hong Kong and any rules made under that Ordinance.

This prospectus supplement and the accompanying prospectus have not been registered with the Registrar of Companies in Hong Kong. Accordingly, this prospectus supplement and the accompanying prospectus may not be issued, circulated or distributed in Hong Kong, and the securities may not be offered to members of the public in Hong Kong. Each person acquiring the securities will be required, and is deemed by the acquisition of the securities, to confirm that he is aware of the restriction on offers of the securities described in this prospectus supplement and the accompanying prospectus and that he is not acquiring, and has not been offered any securities in circumstances that contravene any such restrictions.

Japan

The offering has not been and will not be registered under the Financial Instruments and Exchange Law of Japan (Law No. 25 of 1948 of Japan, as amended), or FIEL, and the Initial Purchaser will not offer or sell any securities, directly or indirectly, in Japan or to, or for the benefit of, any resident of Japan (which term as used herein means, unless otherwise provided herein, any person resident in Japan, including any corporation or other entity organized under the laws of Japan), or to others for re-offering or resale, directly or indirectly, in Japan or to a resident of Japan, except pursuant to an exemption from the registration requirements of, and otherwise in compliance with, the FIEL and any other applicable laws, regulations and ministerial guidelines of Japan.

Singapore

This prospectus supplement and the accompanying prospectus have not been and will not be lodged or registered with the Monetary Authority of Singapore. Accordingly, this prospectus supplement and the accompanying prospectus and any other document or material in connection with the offer or sale, or the invitation for subscription or purchase of the securities may not be issued, circulated or distributed, nor may the securities be offered or sold, or be made the subject of an invitation for subscription or purchase, whether directly or indirectly, to the public or any member of the public 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 as defined under Section 275(2), or any person pursuant to Section 275(1A) of the SFA, 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 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 under 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 is an accredited investor, shares, debentures and units of shares and debentures of that corporation or the beneficiaries' rights and interest in that trust shall not be transferable for six months after that corporation or that trust has acquired the Offer Shares under Section 275 of the SFA except:

(i) to an institutional investor under Section 274 of the SFA or to a relevant person defined in Section 275(2) of the SFA, or to any person pursuant to an offer that is made on terms that such shares, debentures and units of shares and debentures of that corporation or such rights and interest in that trust are acquired at a consideration of not less than $200,000 (or its equivalent in a foreign currency) for each transaction, whether such amount is to be paid for in cash or by exchange of securities or other assets, and further for corporations, in accordance with the conditions, specified in Section 275 of the SFA;

(ii) where no consideration is given for the transfer; or

(iii) where the transfer is by operation of law.

Israel

In the State of Israel, the securities offered hereby may not be offered to any person or entity other than the following:

a fund for joint investments in trust (i.e., mutual fund), as such term is defined in the Law for Joint Investments in Trust, 5754-1994, or a management company of such a fund;

a provident fund as defined in the Control of the Financial Services (Provident Funds) Law 5765-2005, or a management company of such a fund;

an insurer, as defined in the Law for Oversight of Insurance Transactions, 5741-1981,

a banking entity or satellite entity, as such terms are defined in the Banking Law (Licensing), 5741-1981, other than a joint services company, acting for their own account or for the account of investors of the type listed in Section 15A(b) of the Securities Law 1968;

a company that is licensed as a portfolio manager, as such term is defined in Section 8(b) of the Law for the Regulation of Investment Advisors and Portfolio Managers, 5755-1995, acting on its own account or for the account of investors of the type listed in Section 15A(b) of the Securities Law 1968;

an investment advisor or investment distributer, as such term is defined in Section 7(c) of the Law for the Regulation of Investment Advisors and Portfolio Managers, 5755-1995, acting on its own account;

a member of the Tel Aviv Stock Exchange, acting on its own account or for the account of investors of the type listed in Section 15A(b) of the Securities Law 1968;

an underwriter fulfilling the conditions of Section 56(c) of the Securities Law, 5728-1968, acting on its own account;

a venture capital fund (defined as an entity primarily involved in investments in companies which, at the time of investment, (i) are primarily engaged in research and development or manufacture of new technological products or processes and (ii) involve above-average risk);

an entity fully owned by investors of the type listed in Section 15A(b) of the Securities Law 1968;

an entity, other than an entity formed for the purpose of purchasing securities in this offering, in which the shareholders equity is in excess of NIS 50 million; and

An individual, fulfilling the conditions of section 9 to the supplement to the Law for the Regulation of Investment Advisors and Portfolio Managers, 5755-1995, acting on its own account, and for this matter, the Section 9 to the supplement shall be referred to instead of "as an eligible client for the meaning of this law", as "as an investor for the meaning of Section15A(b)(1) of the Securities Law 1968.

Any offeree of the securities offered hereby, or an Investor, in the State of Israel shall be required to submit written confirmation that it falls within the scope of one of the above criteria and that it is fully aware of the significance of being an Investor pursuant to the list above and he has given his consent, or, the Consent; an appeal to an Investor for the Consent shall not be considered as a public offering. This prospectus supplement will not be distributed or directed to investors in the State of Israel who do not fall within one of the above criteria.

In addition, if a purchase of securities was made within an institutional trading system as the term is defined in the Tel Aviv Stock Exchange regulations, a person giving a stock exchange member his prior Consent, before submitting a purchase order to the institutional trading system for the first time, will be seen as acting within the provisions the above criteria in regards to the Consent, provided that if it is an investor pursuant to subsections (f) or (j) until (l) specified above, he committed in advance that until the last business day of the third month in each year he will renew his Consent, and if he will cease to have given Consent, he will notify the stock exchange member immediately and will cease to give purchase orders in the said trading institution.

Description of Warrants

The warrants to be issued in this offering represent the right to purchase up to shares of common stock at an initial exercise price of $ per share. Each warrant may be exercised at any time and from time to time on or after , 201_ and through and including , .

Exercise

Holders of the warrants may exercise their warrants to purchase shares of our common stock on or before the expiration date by delivering (i) an exercise notice, appropriately completed and duly signed, and (ii) if such holder is not utilizing the cashless exercise provisions, payment of the exercise price for the number of shares with respect to which the warrant is being exercised. Warrants may be exercised in whole or in part, but only for full shares of common stock, and any portion of a warrant not exercised prior to the expiration date shall be and become void and of no value. We provide certain rescission, compensation and buy-in rights to a holder if we fail to deliver the shares of common stock underlying the warrants by the third trading day after delivery to us of the exercise notice. With respect to the rescission rights, the holder has the right to rescind the exercise. The buy-in rights apply if after such third trading day the holder purchases (in an open market transaction or otherwise) shares of our common stock to deliver in satisfaction of a sale by the holder of the warrant shares that the holder anticipated receiving from us upon exercise of the warrant. In this event, we will:

- pay cash to the holder in an amount equal to the excess (if any) of the buy-in price over the product of (A) such number of shares of common stock, times (B) the price at which the sell order giving rise to holder's purchase obligation was executed; and

- at the election of holder, either (A) reinstate the portion of the warrant as to such number of shares of common stock, or (B) deliver to holder a certificate or certificates representing such number of shares of common stock.

In addition, the warrant holders are entitled to a "cashless exercise" option if, at any time of exercise, there is no effective registration statement registering, or no current prospectus available for, the issuance or resale of the shares of common stock underlying the warrants. This option entitles the warrant holder to elect to receive fewer shares of common stock without paying the cash exercise price. The number of shares to be issued would be determined by a formula based on the total number of shares with respect to which the warrant is being exercised, the volume weighted average of the prices per share of our common stock on the trading date immediately prior to the date of exercise and the applicable exercise price of the warrants.

The shares of common stock issuable on exercise of the warrants will be, when issued in accordance with the warrants, duly and validly authorized, issued and fully paid and non-assessable. We will authorize and reserve at least that number of shares of common stock equal to the number of shares of common stock issuable upon exercise of all outstanding warrants.

Delivery of Certificates

Upon the holder's exercise of a warrant, we will promptly, but in no event later than three trading days after the exercise date, issue and deliver, or cause to be issued and delivered, a certificate for the shares of common stock issuable upon exercise of the warrant. In addition, we will, if the holder provides the necessary information to us, issue and deliver the shares electronically through The Depository Trust Corporation through its Deposit Withdrawal Agent Commission System or another established clearing corporation performing similar functions.

Certain Adjustments

The exercise price and the number of shares of common stock purchasable upon the exercise of the warrants are subject to adjustment upon the occurrence of the following events:

Stock Dividends and Splits

If, at any time while the warrant is outstanding, we (i) pay a stock dividend or otherwise make a distribution on shares of common stock or any other equity or equity equivalent securities payable in shares of common stock, (ii) subdivide outstanding shares of common stock into a larger number of shares, (iii) combine outstanding shares of common stock into a smaller number of shares, or (iv) issue by reclassification of common stock any shares of capital stock, then in each such case the exercise price shall be multiplied by a fraction of which the numerator shall be the number of shares of common stock outstanding immediately before such event and of which the denominator shall be the number of shares of common stock outstanding immediately after such event, and the number of shares issuable upon exercise of this Warrant shall be proportionately adjusted such that the aggregate exercise price of the warrant shall remain unchanged.

Subsequent Rights Offerings

If, at any time while the warrant is outstanding, we issue rights, options or warrants to all holders of our common stock entitling them to purchase our common stock at a price per share less than the volume weighted average price on the date of the issuance of such rights, options or warrants, then the exercise price shall be multiplied by a fraction, of which the denominator shall be the number of shares of common stock outstanding on the date of issuance of such rights or warrants plus the number of additional shares of common stock offered for subscription or purchase, and of which the numerator shall be the number of shares of common stock outstanding on the date of issuance of such rights or warrants plus the number of shares which the aggregate offering price of the total number of shares so offered would purchase at such volume weighted average price.

Pro Rata Distributions

If, at any time while the warrant is outstanding, we distribute evidence of our indebtedness or assets or rights or warrants to purchase any security other than our common stock to all holders of our common stock, or, distribution, then the exercise price will adjust pursuant to a volume weighted average price based ratio that takes into account the then per share fair market value of the portion of the Distribution applicable to one outstanding share of the Common Stock.

Fundamental Transactions

If, at any time while the warrant is outstanding, we (i) consolidate or merge with or into another corporation, (ii) sell all or substantially all of our assets, (iii) are subject to or complete a tender or exchange offer pursuant to which holders of our common stock are permitted to tender or exchange their shares for other securities, cash or property, or (iv) effect any reclassification of our common stock or any compulsory share exchange pursuant to which our common stock is converted into or exchanged for other securities, cash or property, each, a Fundamental Transaction, then the holders shall have the right thereafter to receive, upon exercise of the warrant, the same amount and kind of securities, cash or property as it would have been entitled to receive upon the occurrence of such Fundamental Transaction if it had been, immediately prior to such Fundamental Transaction, the holder of the number of warrant shares then issuable upon exercise of the warrant, which we refer to in this prospective supplement as Alternate Consideration. Any successor to us, surviving entity or the corporation purchasing or otherwise acquiring such assets shall assume the obligation to deliver to the holder such Alternate Consideration as the holder may be entitled to purchase, and the other obligations under the warrant.

In the event of certain Fundamental Transactions, the holders of the warrants will be entitled to receive, in lieu of our common stock and at the holders' option, cash in an amount equal to the value of the remaining unexercised portion of the warrant on the date of the transaction determined using a Black-Scholes option pricing model with an expected volatility equal to the 100 day historical price volatility obtained from Bloomberg L.P. as of the trading day immediately prior to the public announcement of the transaction.

Notice of Corporate Action

We will provide notice to holders of the warrants to provide such holders with an opportunity to exercise their warrants and hold common stock in order to participate in or vote on the following corporate events if we (i) declare a dividend on the common stock, (ii) declare a special nonrecurring cash dividend on or a redemption of the common stock, (iii) authorize the granting to all holders of the common stock rights or warrants to subscribe for or purchase any shares of capital stock of any class or of any rights, (iv) require the approval of any stockholders in connection with any reclassification of the common stock, any consolidation or merger to which we are a party, any sale or transfer of all or substantially all of our assets, any compulsory share exchange whereby the common stock is

converted into other securities, cash or property, or (v) authorize the voluntary or involuntary dissolution, liquidation or winding up of the affairs of the Company.

Limitations on Exercise

The number of warrant shares that may be acquired by the holder upon any exercise of the warrant shall be limited to the extent necessary to insure that, following such exercise (or other issuance), the total number of shares of common stock then beneficially owned by such holder and its affiliates and any other persons whose beneficial ownership of common stock would be aggregated with the holder's for purposes of Section 13(d) of the Exchange Act, does not exceed 4.99% of the total number of issued and outstanding shares of common stock (including for such purpose the shares of common stock issuable upon such exercise), which we refer to as the Beneficial Ownership Limitation. The holder may elect to change the Beneficial Ownership Limitation from 4.99% to 9.99% of the total number of issued and outstanding shares of common stock (including for such purpose the shares of common stock issuable upon such exercise) upon 61 days' prior written notice.

Waivers and Amendments

The warrants may be modified or amended and the provisions therein may be waived with the written consent of the Company and holders holding warrants at least equal to 67% of the warrant shares issuable upon exercise of all then outstanding warrants.

Additional Provisions

The above summary of certain terms and provisions of the warrants is qualified in its entirety by reference to the detailed provisions of the warrants, the form of which will be filed as an exhibit to a current report on Form 8-K that is incorporated herein by reference. We are not required to issue fractional shares upon the exercise of the warrants. No holders of the warrants will possess any rights as a stockholder under those warrants until the holder exercises those warrants. The warrants may be transferred independent of the common stock they were issued with, on a form of assignment, subject to all applicable laws.

Legal Matters

The validity of the securities offered hereby will be passed upon for us by Zysman, Aharoni, Gayer and Sullivan & Worcester LLP, Boston, Massachusetts. Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C., New York, New York, is acting as counsel for the underwriters in connection with this offering.

Experts

The financial statements of Pluristem Therapeutics Inc. appearing in Pluristem Therapeutics Inc.’s 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 Current Reports on Form 8-K filed with the SEC on July 26, 2012, August 6, 2012, August 7, 2012 and September 5, 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.

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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,” “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.