SENESCO TECHNOLOGIES INC
Form S-3
October 12, 2007

As filed with the Securities and Exchange Commission on October 12, 2007

Registration No. 333-

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM S-3

REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

SENESCO TECHNOLOGIES, INC.

(Exact name of registrant as specified in its charter)

Delaware	**84-1368850**
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification Number)

303 George Street, Suite 420, New Brunswick, New Jersey 08901
(732) 296-8400
(Address, including zip code, and telephone number, including area code, of registrant s principal executive offices)

Bruce C. Galton, President and Chief Executive Officer
303 George Street, Suite 420, New Brunswick, New Jersey 08901
(732) 296-8400
(Name, address, including zip code, and telephone number, including area code, of agent for service)

Copies of all communications, including all communications sent to the agent for service, should be sent to:

Emilio Ragosa, Esq.
Morgan, Lewis & Bockius LLP
502 Carnegie Center
Princeton, New Jersey 08540
(609) 919-6600

APPROXIMATE DATE OF COMMENCEMENT OF PROPOSED SALE TO THE PUBLIC: From time to time, at the discretion of the selling stockholders, as soon as practicable after this registration statement becomes effective.

If the only securities being registered on this form are being offered pursuant to dividend or interest reinvestment plans, check the following box. o

If any of the securities being registered on this form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, other than securities offered only in connection with dividend or reinvestment interest plans, check the following box. o

If this form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. o

If this form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. o

If this form is a registration statement pursuant to General Instruction I.D. or a post-effective amendment thereto that shall become effective upon filing with the Commission pursuant to Rule 462(e) under the Securities Act, check the following box. o

If this form is a post-effective amendment to a registration statement filed pursuant to General Instruction I.D. filed to register additional securities or additional classes of securities pursuant to Rule 413(b) under the Securities Act, check the following box. o

CALCULATION OF REGISTRATION FEE

Title Of Shares To Be Registered	Amount To Be Registered	Proposed Maximum Aggregate Price Per Share	Proposed Maximum Aggregate Offering Price	Amount Of Registration Fee
Common Stock, $0.01 par value	3,333,333(1)	$ 0.75(2)	$ 2,500,000	$ 76.75

(1) Represents 3,333,333 shares of common stock that may be issued upon conversion of convertible debentures held by the selling stockholders. Pursuant to Rule 416 of the Securities Act of 1933, as amended, this registration statement shall also cover any additional shares of common stock by reason of any stock dividend, stock split, recapitalization or other similar transaction or to cover such additional shares as may hereinafter be offered or issued to prevent dilution resulting from stock splits, stock dividends, recapitalizations or certain other capital adjustments, effected without the registrant s receipt of consideration, which results in an increase in the number of the outstanding shares of registrant s common stock.

(2) Estimated solely for the purpose of calculating the registration fee pursuant to Rule 457(c). Such price is based upon the average of the high and low prices of the registrant s common stock as reported on the American Stock Exchange on October 11, 2007.

THE REGISTRANT HEREBY AMENDS THIS REGISTRATION STATEMENT ON SUCH DATE OR DATES AS MAY BE NECESSARY TO DELAY ITS EFFECTIVE DATE UNTIL THE REGISTRANT SHALL FILE A FURTHER AMENDMENT WHICH SPECIFICALLY STATES THAT THIS REGISTRATION STATEMENT SHALL THEREAFTER BECOME EFFECTIVE IN ACCORDANCE WITH SECTION 8(A) OF THE SECURITIES ACT OF 1933 OR UNTIL THE REGISTRATION STATEMENT SHALL BECOME EFFECTIVE ON SUCH DATE AS THE COMMISSION, ACTING PURSUANT TO SAID SECTION 8(A), MAY DETERMINE.

The information in this prospectus is not complete and may be changed. The selling stockholders named in this prospectus may not sell these securities until the registration statement filed with the Securities and Exchange Commission is effective. This prospectus is not an offer to sell these securities and it is not soliciting an offer to buy these securities in any state where the offer or sale is not permitted.

SUBJECT TO COMPLETION, DATED OCTOBER 12, 2007

PROSPECTUS

SENESCO TECHNOLOGIES, INC.

3,333,333 Shares of Common Stock

The stockholders of Senesco listed in this prospectus are offering and selling an aggregate of 3,333,333 shares of our common stock. All 3,333,333 shares of common stock are issuable upon conversion of $3,000,000 of convertible debentures held by the selling stockholders at a conversion price of $0.90 per share, subject to certain adjustments.

The shares of our common stock may be offered and sold from time to time by the selling stockholders identified in this prospectus, or their pledgees, donees, transferees or other successors-in-interest through public or private transactions at prevailing market prices, at prices related to prevailing market prices or at privately negotiated prices. The selling stockholders will pay all underwriting discounts and selling commissions, if any, applicable to the sale of the shares.

Our common stock is traded on the American Stock Exchange under the ticker symbol SNT. On October 11, 2007, the last reported sale price of our common stock was $0.75 per share. You are urged to obtain current market quotations for the common stock.

Investing in our common stock involves a high degree of risk. See Risk Factors beginning on page 3 for a discussion of certain factors that you should consider before you invest in any of the common stock being offered with this prospectus.

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

The date of this prospectus is _____, 2007.

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As used in this prospectus, references to Senesco, we, us, and our refer to Senesco Technologies, Inc. and its subsidiary, Senesco, Inc., unless th context otherwise requires.

PROSPECTUS SUMMARY

About This Prospectus

This prospectus is a part of a registration statement on Form S-3 filed by us with the Securities and Exchange Commission, referred to herein as the SEC, to register 3,333,333 shares of our common stock. This prospectus does not contain all of the information set forth in the registration statement, certain parts of which are omitted in accordance with the rules and regulations of the SEC. Accordingly, you should refer to the registration statement and its exhibits for further information about us and our common stock. Copies of the registration statement and its exhibits are on file with the SEC. Statements contained in this prospectus concerning the documents we have filed with the SEC are not intended to be comprehensive, and in each instance we refer you to the copy of the actual document filed as an exhibit to the registration statement or otherwise filed with the SEC.

We have not authorized anyone to provide you with information different from that contained or incorporated by reference in this prospectus. The selling stockholders are offering to sell, and seeking offers to buy, shares of our common stock only in jurisdictions where offers and sales are permitted. The information contained in this prospectus is accurate only as of the date of this prospectus, regardless of the time of delivery of this prospectus or of any sale of common stock.

About the YA Global Investments, L.P. Financing

On August 1, 2007, referred to herein as the signing date, we entered into a binding Securities Purchase Agreement to sell up to $5,000,000 of secured convertible debentures, referred to herein as the convertible debentures, and accompanying warrants to YA Global Investments, L.P., referred to herein as the YA Global financing. There have been no prior securities transactions between us and YA Global Investments, L.P. or its affiliates. There have been no relationships between us and YA Global Investments, L.P., or its affiliates, during the past three years.

The convertible debentures convert into our common stock at a fixed price of $0.90 per share subject to certain adjustments, referred to herein as the fixed conversion price, for a period of two years immediately following the signing date, provided that we have achieved certain milestones by January 31, 2008. After the second anniversary of the signing date, or if we do not achieve certain milestones by January 31, 2008, the convertible debentures may convert into shares of our common stock at the lower of the fixed conversion price or 80% of the lowest daily volume-weighted average price, referred to herein as the VWAP, of our common stock during the five trading days prior to the conversion date, referred to herein as the market conversion price. The maturity date of each of the convertible debentures is December 30, 2010. Currently, at the fixed conversion price, the number of shares of common stock issuable upon conversion of the convertible debentures and exercise of warrants represents, in the aggregate, 11,111,111 shares, plus an estimated additional 1,200,000 shares for the payment of interest in stock under the convertible debentures. Pursuant to the Securities Purchase Agreement, we have issued to YA Global Investments, L.P.:

- a convertible debenture in the amount of $1,500,000 and warrants on September 21, 2007; and
- a convertible debenture in the amount of $1,500,000 on the date this registration statement was filed, pursuant to the Registration Rights Agreement, with the SEC.

We have agreed to issue to YA Global Investments, L.P., subject to approval by the American Stock Exchange and the other closing conditions set forth in the Securities Purchase Agreement, a convertible debenture in the amount of $2,000,000 and a Series B warrant for 2,775,000 shares of common stock at an exercise price of $0.90 on the date that is the later of (a) the date stockholders approve the transaction or (b) the date this registration statement is declared effective by the SEC.

The following table illustrates the value of our common stock underlying the convertible debentures and potential discount to market price that YA Global Investments, L.P. may receive.

Market Price(1)	Exercise Price(2)	Total Shares Underlying Convertible Debentures(3)	Total Value of Shares at Market Price(4)	Total Value of Shares at Conversion Price(5)	Total Possible Discount to Market Price(6)
$1.00	$0.90	5,555,555	$5,555,555	$5,000,000	$555,555

(1) Market price per share of our common stock on July 31, 2007 (the closing price prior to the signing of the definitive agreements).

(2) For the purposes of this example, we have used the fixed conversion price. Pursuant to the terms of the convertible debentures, if the conversion is after the second anniversary of the signing date, or if we do not achieve certain milestones by January 31, 2008, the convertible debentures may convert into shares of our common stock at the market conversion price.

(3) Total number of shares of common stock underlying the convertible debentures assuming full conversion at the fixed conversion price.

(4) Total market value of shares of common stock underlying the convertible debentures assuming full conversion of the convertible debentures and based on the market price of the common stock on July 31, 2007.

(5) Total value of shares of common stock underlying the convertible debentures assuming full conversion of the convertible debentures and based on the fixed conversion price.

(6) Discount to market price calculated by subtracting the result in footnote (5) from the result in footnote (4).

Pursuant to the Securities Purchase Agreement and the rules of the American Stock Exchange, the convertible debentures and warrants are subject to a cap on the number of shares of common stock that can be issued upon the conversion of the convertible debentures and the exercise of the warrants. The cap of 3,493,000 shares is equal to 19.99% of our outstanding common stock on the signing date. In addition, upon shareholder approval, the maximum number of shares that can be issued pursuant to the YA Global financing is 30,500,000.

The convertible debentures accrue interest on their outstanding principal balances at an annual rate of 8%. We have the option to pay interest in cash or, upon certain conditions, common stock. If we pay interest in common stock, the stock will be valued at a 10% discount to the average daily VWAP for the five day trading period prior to the interest payment date, referred to herein as interest shares.

At our option, we can redeem a portion of, or all of, the principal owed under the convertible debentures by providing the investor with at least 30 business days written notice; provided that, at the time of receipt of the notice, either: (A)(i) the VWAP of our common stock exceeds 130% of the fixed conversion price for at least 20 of 30 prior trading days and (ii) there is an effective registration statement for the resale of the common stock that will be issued under the redemption or (B) we redeem a portion, or all, of the principal owed at a 20% premium above the principal then outstanding and any accrued interest

thereupon. If we redeem all or any of the principal outstanding under the convertible debentures, we will pay an amount equal to the principal being redeemed plus accrued interest.

If there is an effective registration statement for the resale of the shares underlying the convertible debentures or if such shares become 144(k) eligible, we will have the option to force the investor to convert 50% and 100% of its then-outstanding convertible debentures if our common stock price exceeds 150% and 175% of the fixed conversion price, respectively, for any 20 out of 30 trading days; provided that such forced conversion meets certain conditions, referred to herein as the call option. If we exercise our call option prior to the third anniversary of the signing date, we will issue additional warrants to the investor equal to 50% of the number of shares underlying the convertible debenture subject to the forced conversion. These warrants will be exercisable at the fixed conversion price and will have the same maturity as the other warrants issued under the YA Global financing.

Our obligations under the convertible debentures are secured by all of our and our subsidiary s assets and intellectual property, as evidenced by the Security Agreement, dated September 21, 2007 and the Patent Security Agreement, dated September 21, 2007.

YA Global was issued, and will be issued, warrants to purchase our common stock, with an expiration date that is five years from the date of issuance. The warrants represent the right to purchase the aggregate of 5,550,000 shares of our common stock. The warrants are issued in two series. The exercise price of the Series A warrants is $1.01 per share, and the exercise price of the Series B warrants is $0.90 per share, subject to certain adjustments. The warrants provide a right of cashless exercise if, at the time of exercise, there is no effective registration statement registering the resale of the shares underlying the warrants. The Series A warrants are exercisable on the date that is six months from the date of issuance, and the Series B warrants are exercisable immediately upon issuance.

The following table illustrates the premium or discount of the Series A warrants assuming YA Global Investments, L.P. exercises them on a cash basis.

Market Price(1)	Exercise Price(2)	Total Shares Underlying the Series A Warrants(3)	Total Value of Shares at Market Price(4)	Total Value of Shares at Exercise Price(5)	Total Possible Premium to Market Price(6)
$1.00	$1.01	2,775,000	$2,775,000	$2,802,750	-$27,750

(1) Market price per share of our common stock on July 31, 2007.

(2) Exercise price per share of our common stock. The exercise price of the Series A warrants are fixed pursuant to the terms of the Series A warrants.

(3) Total number of shares of common stock underlying the Series A warrants assuming full conversion of the Series A warrants.

(4) Total market value of the shares of common stock underlying the Series A warrants assuming full exercise of the Series A warrants based on the market price of the common stock on July 31, 2007.

(5) Total value of shares of common stock underlying the Series A warrants assuming full exercise of the Series A warrants based on the exercise price.

(6) Discount to market price calculated by subtracting the result in footnote (5) from the result in footnote (4).

The following table illustrates the discount or premium of the Series B warrant assuming YA Global Investments, L.P. exercises it on a cash basis.

Market Price(1)	Exercise Price(2)	Total Shares Underlying the Series B Warrant(3)	Total Value of Shares at Market Price(4)	Total Value of Shares at Exercise Price(5)	Total Possible Discount to Market Price(6)
$1.00	$0.90	2,775,000	$2,775,000	$2,497,500	$277,500

(1) Market price per share of our common stock on July 31, 2007.

(2) Exercise price per share of our common stock. The exercise price of the Series B warrant is fixed pursuant to the terms of the Series B warrant, except that the Series B warrant contains anti-dilution protections which, in certain circumstances, may result in a reduction to the exercise price.

(3) Total number of shares of common stock underlying the Series B warrant assuming full conversion of the Series B warrant.

(4) Total market value of the shares of common stock underlying the Series B warrant assuming full exercise of the Series B warrant based on the market price of the common stock on July 31, 2007.

(5) Total value of shares of common stock underlying the Series B warrant assuming full exercise of the Series B warrant based on the exercise price.

(6) Discount to market price calculated by subtracting the result in footnote (5) from the result in footnote (4).

The following table summarizes the potential profit that YA Global Investments, L.P. may achieve from the convertible debentures and warrants. For purposes of the table, we have assumed the full amount of the principal of the convertible debentures is converted at the fixed conversion price ($0.90) and full exercise of the warrants. We also have given the potential profit calculations assuming different price levels of the common stock of the company. The second and third market prices were arbitrarily selected based on the recent trading history of the common stock.

Market Price	Total Possible Profit on Convertible Debenture Shares	Total Possible Profit on Series A Warrant Shares	Total Possible Profit on Series B Warrant Shares	Total
$1.00	$555,555	-$27,750	$277,500	$805,305
$1.10	$1,111,111	$249,750	$555,000	$1,915,861
$1.20	$1,666,666	$527,250	$832,500	$3,026,416

The conversion rate of each convertible debenture and the exercise price of the Series B warrants are subject to adjustment for certain events, including dividends, stock splits, combinations and the sale of our common stock or securities convertible into or exercisable for our common stock at a price less than the then applicable conversion or exercise price.

The investor has a right of first refusal on any future funding that involves the issuance of our capital stock for so long as a portion of the convertible debentures is outstanding.

Under the Registration Rights Agreement, we agreed to file this initial registration statement with the SEC to register the resale of 3,333,333 shares of common stock issuable pursuant to the YA Global financing, referred to herein as the registrable shares, within 30 days of the signing date. Also, we have agreed to respond to all SEC comment letters as promptly as reasonably possible and to use our best efforts to have this registration statement declared effective within 120 days of the signing date. The value of the total number of shares of common stock that we are currently registering pursuant to this Registration Rights Agreement, based on the market price per share of our common stock on October 11, 2007 is $2,500,000, using a market price of $0.75. There is no guarantee that the SEC will declare this registration statement effective. Upon certain events, we have agreed to pay as partial liquidated damages an amount equal to 1.0% of the aggregate purchase price paid by the investor for any convertible debentures then held by the investor, but these payments may not exceed 12% of the aggregate purchase price paid by the investor.

The purchaser of the convertible debentures represented that it is an accredited investor and agreed that the securities issued in the YA Global financing bear a restrictive legend against resale without registration under the Securities Act. The convertible debentures and warrants were sold pursuant to the exemption from registration afforded by Section 4(2) of the Securities Act and Regulation D thereunder.

The gross proceeds from the convertible debentures will be $5,000,000 before payment of 3.5% of the purchase price in commissions to the placement agent. We have issued, and agreed to issue, to the placement agent: (A) warrants to purchase 116,667 shares of our common stock with an exercise price equal to $1.01 on the first closing of the YA Global financing, which warrants are not exercisable for six months from the first closing; (B) warrants to purchase 116,667 shares of our common stock with an exercise price equal to $1.01 on the second closing of the YA Global financing, which warrants are not exercisable for six months from the second closing and (C) warrants to purchase 155,556 shares of common stock with an exercise price equal to $0.74 on the third closing of the YA Global financing. We paid YA Global Investments, L.P. a non-refundable structuring/ due diligence fee of $30,000. We have also agreed to pay YA Global Investments, L.P. a commitment fee of 5% of its purchase price, which is paid proportionately at each closing.

The following table summarizes the potential payments we may be required to pay to YA Global Investments, L.P. For purposes of this table, we have assumed that the entire $5,000,000 aggregate principal amount of the convertible debentures were issued and sold on September 21, 2007. The table reflects all the payments of fees, interest and premiums due during the term of the convertible debentures and warrants.

Maximum Commitment Fee(1)	Structuring and Due Diligence Fees(2)	Maximum Interest Payments (3)	Maximum Redemption Premiums(4)	Maximum Liquidated Damages(5)	Total Maximum Payments(6)	Total Net Proceeds to Company(7)
$250,000	$30,000	$1,312,500	$1,000,000	$600,000	$1,592,500	$3,407,500

(1) We agreed to pay YA Global Investments, L.P. a commitment fee equal to 5% of the $5,000,000 purchase price of the convertible debentures issued and to be issued. As of the filing of this registration statement, $3,000,000 of the convertible debentures have been issued and we paid YA Global Investments, L.P. $150,000 in commitment fees. Upon the date that is the later of (a) the date stockholders approve the transaction or (b) the date this registration statement is declared effective by the SEC, we will issue an additional $2,000,000 of convertible debentures and owe an additional fee to YA Global Investments, L.P. of $100,000, subject to approval by the American Stock Exchange.

(2) We paid YA Global Investments, L.P. an aggregate of $30,000 in structuring and due diligence fees in connection with the YA Global financing.

(3) Maximum amount of interest that can accrue assuming all the convertible debentures remain outstanding until the maturity date and assuming they were all issued on September 21, 2007. We may pay accrued interest in either cash or, at our option, in shares of our common stock.

(4) Under certain circumstances we have the right to redeem any principal amount of the convertible debentures prior to the maturity date by repaying the principal plus a redemption premium of 20%. This represents the maximum redemption premium we would pay assuming we redeem the all of the principal of the convertible debentures prior to maturity at the redemption premium.

(5) Maximum amount of liquidated damages we may be required to pay.

(6) Total maximum payments that we may be required to make for the term of the convertible debentures and assuming that we made all of the payments described in footnotes 1 through 3.

(7) Total net proceeds to us assuming that we were not required to make any payments as described in footnotes (4) and (5).

The following table summarizes the potential proceeds available to us pursuant to the YA Global financing. For purposes of this table, we have assumed that the $5,000,000 aggregate principal amount of convertible secured debentures were issued and sold on September 21, 2007 and that YA Global Investments, L.P. exercises all of the warrants on a cashless basis.

Total Gross Proceeds Payable to Company(1)	**Total Facility Set Up Payments by Company(2)**	**Total Maximum Payments by Company(3)**	**Net Proceeds to Company(4)**
$5,000,000	$280,000	$1,767,500	$3,232,500

(1) Total gross proceeds payable to us. If YA Global Investments, L.P. exercises the warrants on a cash basis, then the additional gross proceeds payable to us will be $5,300,250.

(2) Total payments payable by us, including the commitment fee and the structuring fee, to establish the facility.

(3) Total maximum payments that have been paid and may be payable in connection with the facility, including commitment fee, structuring fee, legal expenses (of approximately $175,000) and interest.

(4) Total net proceeds to us calculated by subtracting the result in footnote (3) from the result in footnote (1). If YA Global Investments, L.P. exercises the warrants on a cash basis, then the total net proceeds payable to us will be $8,532,750. The expenses set forth in column #3 above will not change in the event of the cash exercise of the warrants.

The following table sets forth the number of shares of common stock of the company issued and outstanding and issued and outstanding held by non-affiliates of the company, and the number of shares which have been registered for resale by YA Global Investments, L.P. as a percentage of both numbers.

Total Number of Shares Outstanding(1)	**Total Number of Shares held by Non-Affiliates of the Company**	**Total Number of Shares Registered for Resale by Selling Shareholder**	**Resale Shares as a Percent of Outstanding**	**Resale Shares as a Percent of Non-Affiliates**
17,473,694	12,883,845	3,333,333	19.1%	25.9%

(1) As of September 30, 2007.

About Senesco

The primary business of Senesco Technologies, Inc., a Delaware corporation incorporated in 1999, and its wholly-owned subsidiary, Senesco, Inc., a New Jersey corporation incorporated in 1998, collectively referred to as Senesco, we, us or our, is to utilize our patented and patent-pending genes, primarily eucaryotic translation initiation Factor 5A, or Factor 5A, and deoxyhypusine synthase, or DHS, in human health applications to:

- develop novel approaches to treat inflammatory and / apoptotic related diseases in humans;
- develop novel approaches to treat cancer, a group of diseases in which apoptosis does not occur normally; and
- Factor 5A, DHS and Lipase in agricultural applications, to enhance the quality and productivity of fruits, flowers, and vegetables and agronomic crops through the control of cell death, referred to as senescence, and growth in plants.

We believe that our gene technology could have broad applicability in the human health field, by either inhibiting or accelerating apoptosis. Inhibiting apoptosis may be useful in preventing or treating a wide range of inflammatory and ischemic diseases attributed to premature apoptosis, including diabetes, diabetic retinopathy and lung inflammation, among others. Accelerating apoptosis may be useful in treating certain forms of cancer because the body s immune system is not able to force cancerous cells to undergo apoptosis.

Our human health research program, which has consisted of pre-clinical in-vitro and in-vivo experiments designed to assess the role and method of action of the Factor 5A genes in human diseases, is performed by approximately 16 third party researchers, at our direction, at the University of Waterloo, Mayo Clinic, the University of Colorado, the University of Virginia, and the University of Florida.

Our preclinical research has yielded data that we have presented to various biopharmaceutical companies that may be prospective licensees for the development and marketing of potential applications of our technology. Additionally, we plan on using the proceeds of our recent financing to advance a certain cancer target with the goal of initiating a Phase I clinical trial, and may select additional human health

indications, to bring into clinical trials on our own. Successful future operations will depend on our ability to transform our research and development activities into a commercially feasible technology.

Certain preclinical human health results to date include:

- increasing median survival by approximately 250% in a tumor model of mice injected with melanoma cancer cells;

- inducing apoptosis in both human cancer cell lines derived from tumors and in lung tumors in mice;

- inducing apoptosis of cancer cells in a human multiple myeloma cell line;

- measuring VEGF reduction in mouse lung tumors as a result of treatment with our genes;

- reducing the amounts of p24 and IL-8 by approximately 50 percent in an HIV-1 infected human cell line;

- increasing the survival, while maintaining functionality, of mouse pancreatic islet cells isolated for transplantation; preliminary animal studies have shown that siRNA to Factor 5A administered prior to harvesting beta islet cells from a mouse, has a significant impact not only on the survival of the beta islet cells, but also on the retention of the cells functionality when compared to the untreated beta islet cells. Additional studies have also shown that the treated beta islet cells survive a pro-inflammatory cytokine challenge, while maintaining their functionality with respect to insulin levels;

- confirmed protection during pro-inflammatory cytokine challenge;

- demonstrating that the efficacy of our technology is comparable to that of existing approved anti-inflammatory prescription drugs in reducing certain inflammatory cytokines in mice; and

- increasing the survival rate of mice in a lethal challenge sepsis model. Additionally, a broad spectrum of systemic pro-inflammatory cytokines were down-regulated.

We are planning to advance a certain cancer target toward a Phase I clinical trial. In connection with the potential clinical trial, we will be working towards engaging a clinical research organization to assist us through the process, completing a pre-clinical animal model of the disease and evaluating potential delivery systems for our technology in the animal model, contracting for the supply of pharmaceutical grade materials to be used in toxicology and human studies, and ultimately filing an investigational new drug application with the U.S. Food and Drug Administration for their review and consideration in order to initiate a clinical trial. We estimate that it will take approximately two years to complete this program.

Our agricultural research focuses on the discovery and development of certain gene technologies, which are designed to confer positive traits on fruits, flowers, vegetables, forestry species and agronomic crops. To date, we have isolated and characterized the senescence-induced Lipase gene, DHS, and Factor 5A in certain species of plants. Our goal is to modulate the expression of these genes in order to achieve such traits as extended shelf life, increased biomass, increased yield and increased resistance to environmental stress and disease, thereby demonstrating proof of concept in each category of crop.

Certain agricultural results to date include:

- longer shelf life of perishable produce;\

- increased biomass and seed yield;
- greater tolerance to environmental stresses, such as drought and soil salinity;
- greater tolerance to certain fungal and bacterial pathogens;
- more efficient use of fertilizer; and
- advancement of field trials in banana, lettuce, trees, and bedding plants.

We presently license our technology to agricultural companies capable of incorporating our technology into crops grown for commercial agriculture. We anticipate revenues from these relationships in the form of licensing fees and royalties from our partners, usage fees, or sharing gross profits. In addition, we anticipate payments from our partners upon our achievement of certain research and development benchmarks. This commercialization strategy allows us to generate revenues at various stages of product development, while ensuring that our technology is incorporated into a wide variety of crops. Our optimal partners combine the technological expertise to incorporate our technology into their product line along with the ability to successfully market the enhanced final product, thereby eliminating the need for us to develop and maintain a sales force. We have entered into nine license agreements and one joint venture with established agricultural biotechnology companies.

Our executive offices are located at 303 George Street, Suite 420, New Brunswick, New Jersey 08901, our telephone number is (732) 296-8400 and our Internet address is http://www.senesco.com. The information on our Internet website is not incorporated by reference in this prospectus, and our website address is included in this prospectus as a textual reference only.

THE OFFERING

Number of shares of our common stock offered by the selling stockholders	3,333,333 shares
Number of shares of our common stock outstanding on September 30,2007(1)	17,473,694
Use of proceeds	We will not receive any proceeds from the sale of shares in this offering.
American Stock Exchange symbol	SNT

(1) Does not include 6,000,000 shares reserved for options under our stock plan or 5,144,815 shares reserved for options and warrants issued as of September 30, 2007 outside of our stock plan.

RISK FACTORS

Investing in our common stock involves a high degree of risk. Before you invest in our common stock, you should carefully consider the following factors and cautionary statements, as well as the other information set forth herein. Additional risks and uncertainties may also impair our business operations. If any of the following risks actually occur, our business, financial condition or results of operations may suffer. As a result, the trading price of our common stock could decline, and you could lose all or a substantial portion of your investment in our common stock.

Risks Related to Our Business

We have a limited operating history and have incurred substantial losses and expect future losses.

We are a development stage biotechnology company with a limited operating history and limited assets and capital. We have incurred losses each year since inception and have an accumulated deficit of $25,621,540 at June 30, 2007. We have generated minimal revenues by licensing our technology for certain crops to companies willing to share in our development costs. However, our technology may not be ready for widespread commercialization for several years. We expect to continue to incur losses for the next several years because we anticipate that our expenditures on research and development, commercialization and administrative activities will significantly exceed our revenues during that period. We cannot predict when, if ever, we will become profitable.

Our independent auditors have expressed substantial doubt about our ability to continue as a going concern.

In their audit opinion issued in connection with our consolidated balance sheets as of June 30, 2007 and 2006 and our related consolidated statements of operations, stockholders equity, and cash flows for the three year period ending June 30, 2007, our auditors have expressed substantial doubt about our ability to continue as a going concern given our recurring net losses, negative cash flows from operations, planned spending levels and the limited amount of funds on our balance sheet. We have prepared our financial statements on a going concern basis, which contemplates the realization of assets and the satisfaction of liabilities and commitments in the normal course of business. The consolidated financial statements do not include any adjustments that might be necessary should we be unable to continue in existence.

We may need additional capital to fund our operations until we are able to generate a profit.

Our operations to date have required significant cash expenditures. Our future capital requirements will depend on the results of our research and development activities, preclinical studies and competitive and technological advances.

We do not expect that our revenue and/or cash and investments on hand will cover our expenses during the next twelve months. However, we have entered into definitive agreements to issue convertible debentures and warrants for aggregate gross proceeds of $10,000,000, of which $1,500,000 have been issued on September 21, 2007. The balance of $8,500,000 convertible debentures will be issued as follows: $1,500,000 upon the filing of a registration statement; $2,000,000 upon the later of the filing of a registration statement or receiving shareholder approval; $2,000,000 upon the later of receiving shareholder approval or the effectiveness of the registration statement, $1,500,000 on the date we enter into a supply agreement with a third party manufacturer for sufficient quantity and quality of nano-particle for encapsulation of Factor 5A gene to be used in toxicology and proof of concept human studies under a United States Food and Drug Administration accepted Investigational New Drug application; and $1,500,000 on the date we enter into a supply agreement with a third party manufacturer to provide sufficient quantity and quality of Factor 5A DNA to carry out toxicology and proof of concept human studies under a United States Food and Drug Administration accepted Investigational New Drug application. However, we can not assure you that we will meet the funding milestones or that our stockholders will approve this financing. In addition, this financing is secured by all of our assets. If we

default under the convertible debentures, the investors may foreclose on our assets and our business. As a result, we may need to obtain more funding in the future through collaborations or other arrangements with research institutions and corporate partners or public and private offerings of our securities, including debt or equity financing. We may not be able to obtain adequate funds for our operations from these sources when needed or on acceptable terms. Future collaborations or similar arrangements may require us to license valuable intellectual property to, or to share substantial economic benefits with, our collaborators. If we raise additional capital by issuing additional equity or securities convertible into equity, our stockholders may experience dilution and our share price may decline. Any debt financing may result in restrictions on our spending.

If we are unable to raise additional funds, we will need to do one or more of the following:

- delay, scale-back or eliminate some or all of our research and product development programs;
- license third parties to develop and commercialize products or technologies that we would otherwise seek to develop and commercialize ourselves.
- attempt to sell our company;
- cease operations; or
- declare bankruptcy.

We will continue to maintain an appropriate level of spending over the upcoming fiscal year, given the uncertainties inherent in our business and our current liquidity position. We believe that at the projected rate of spending and the additional $8,500,000 proceeds from the issuance of the convertible debentures, we should have sufficient cash and investments to maintain our present operations for the next 24 months. However, if we do not receive the additional $8,500,000 proceeds from the issuance of the convertible debentures, we should have sufficient cash and investments to maintain our present operations for the next 6 months.

We depend on a single principal technology and, if our technology is not commercially successful, we will have no alternative source of revenue.

Our primary business is the development and commercial exploitation of technology to identify, isolate, characterize and silence genes which control the death of cells in humans and plants. Our future revenue and profitability critically depend upon our ability to successfully develop apoptosis and senescence gene technology and later license or market such technology. We have conducted experiments on certain crops with favorable results and have conducted certain preliminary cell-line and animal experiments, which have provided us with data upon which we have designed additional research programs. However, we cannot give any assurance that our technology will be commercially successful or economically viable for any crops or human health applications.

In addition, no assurance can be given that adverse consequences might not result from the use of our technology such as the development of negative effects on humans or plants or reduced benefits in terms of crop yield or protection. Our failure to obtain market acceptance of our technology or to successfully commercialize such technology or develop a commercially viable product would have a material adverse effect on our business.

We outsource all of our research and development activities and, if we are unsuccessful in maintaining our alliances with these third parties, our research and development efforts may be delayed or curtailed.

We rely on third parties to perform all of our research and development activities. Our primary research and development efforts take place at the University of Waterloo in Ontario, Canada, where our technology was discovered, the University of Colorado, Mayo Clinic, the University of Virginia, the University of Florida, and with our commercial partners. At this time, we do not have the internal capabilities to perform our research and development activities. Accordingly, the failure of third-party

research partners, such as the University of Waterloo, to perform under agreements entered into with us, or our failure to renew important research agreements with these third parties, may delay or curtail our research and development efforts.

We have significant future capital needs and may be unable to raise capital when needed, which could force us to delay or reduce our research and development efforts.

As of June 30, 2007, we had cash and highly-liquid investments valued at $658,061 and working capital of $259,303. Using our available reserves as of June 30, 2007 and the $1,500,000 gross proceeds from the issuance of a convertible debenture on September 21, 2007, we believe that we can operate according to our current business plan for the next six months. However, with the potential additional gross proceeds of $8,500,000 from the issuance of additional convertible debentures, we believe that we can operate according to our current business plan for the next 24 months. To date, we have generated minimal revenues and anticipate that our operating costs will exceed any revenues generated over the next several years. Therefore, we will be required to raise additional capital in the future in order to operate according to our current business plan, and this funding may not be available on favorable terms, if at all. If we are unable to raise additional funds, we will need to do one or more of the following:

- delay, scale back or eliminate some or all of our research and development programs;
- license third parties to develop and commercialize our technology that we would otherwise seek to develop and commercialize ourselves;
- seek strategic alliances or business combinations, or attempt to sell our company; or
- cease operations.

In addition, in connection with any funding, if we need to issue more equity securities than our certificate of incorporation currently authorizes, or more than 20% of the shares of our common stock outstanding, we will need stockholder approval. If stockholder approval is not obtained or if adequate funds are not available, we may be required to curtail operations significantly or to obtain funds through arrangements with collaborative partners or others that may require us to relinquish rights to certain of our technologies, product candidates, products or potential markets. Investors may experience dilution in their investment from future offerings of our common stock. For example, if we raise additional capital by issuing equity securities, such an issuance would reduce the percentage ownership of existing stockholders. In addition, assuming the exercise of all options and warrants outstanding, as of June 30, 2007, we had 31,471,491 shares of common stock authorized but unissued, which may be issued from time to time by our board of directors without stockholder approval. We also have reserved for issuance the proper number of shares to be issued in connection with the convertible dentures issued and to be issued prior to shareholder approval. The total number of shares that may be issued under the financing is subject to certain caps as more fully described elsewhere in the Form 10-K. Furthermore, we may need to issue securities that have rights, preferences and privileges senior to our common stock. Failure to obtain financing on acceptable terms would have a material adverse effect on our liquidity.

Since our inception, we have financed all of our operations through private equity financings. Our future capital requirements depend on numerous factors, including:

- the scope of our research and development;
- our ability to attract business partners willing to share in our development costs;
- our ability to successfully commercialize our technology;
- competing technological and market developments;
- our ability to enter into collaborative arrangements for the development, regulatory approval and commercialization of other products; and

- the cost of filing, prosecuting, defending and enforcing patent claims and other intellectual property rights.

Our business depends upon our patents and proprietary rights and the enforcement of these rights. Our failure to obtain and maintain patent protection may increase competition and reduce demand for our technology.

As a result of the substantial length of time and expense associated with developing products and bringing them to the marketplace in the biotechnology and agricultural industries, obtaining and maintaining patent and trade secret protection for technologies, products and processes is of vital importance. Our success will depend in part on several factors, including, without limitation:

- our ability to obtain patent protection for our technologies and processes;
- our ability to preserve our trade secrets; and
- our ability to operate without infringing the proprietary rights of other parties both in the United States and in foreign countries.

We have been issued fifteen patents by the U.S. Patent and Trademark Office, or PTO, and twelve patents from foreign countries. We have also filed numerous patent applications for our technology in the United States and in several foreign countries, which technology is vital to our primary business, as well as several Continuations in Part on these patent applications. Our success depends in part upon the grant of patents from our pending patent applications.

Although we believe that our technology is unique and will not violate or infringe upon the proprietary rights of any third party, we cannot assure you that these claims will not be made or if made, could be successfully defended against. If we do not obtain and maintain patent protection, we may face increased competition in the United States and internationally, which would have a material adverse effect on our business.

Since patent applications in the United States are maintained in secrecy until patents are issued, and since publication of discoveries in the scientific and patent literature tend to lag behind actual discoveries by several months, we cannot be certain that we were the first creator of the inventions covered by our pending patent applications or that we were the first to file patent applications for these inventions.

In addition, among other things, we cannot assure you that:

- our patent applications will result in the issuance of patents;
- any patents issued or licensed to us will be free from challenge and that if challenged, would be held to be valid;
- any patents issued or licensed to us will provide commercially significant protection for our technology, products and processes;
- other companies will not independently develop substantially equivalent proprietary information which is not covered by our patent rights;
- other companies will not obtain access to our know-how;
- other companies will not be granted patents that may prevent the commercialization of our technology; or
- we will not require licensing and the payment of significant fees or royalties to third parties for the use of their intellectual property in order to enable us to conduct our business.

Our competitors may allege that we are infringing upon their intellectual property rights, forcing us to incur substantial costs and expenses in resulting litigation, the outcome of which would be uncertain.

Patent law is still evolving relative to the scope and enforceability of claims in the fields in which we operate. We are like most biotechnology companies in that our patent protection is highly uncertain and involves complex legal and technical questions for which legal principles are not yet firmly established. In addition, if issued, our patents may not contain claims sufficiently broad to protect us against third parties with similar technologies or products, or provide us with any competitive advantage.

The PTO and the courts have not established a consistent policy regarding the breadth of claims allowed in biotechnology patents. The allowance of broader claims may increase the incidence and cost of patent interference proceedings and the risk of infringement litigation. On the other hand, the allowance of narrower claims may limit the value of our proprietary rights.

The laws of some foreign countries do not protect proprietary rights to the same extent as the laws of the United States, and many companies have encountered significant problems and costs in protecting their proprietary rights in these foreign countries.

We could become involved in infringement actions to enforce and/or protect our patents. Regardless of the outcome, patent litigation is expensive and time consuming and would distract our management from other activities. Some of our competitors may be able to sustain the costs of complex patent litigation more effectively than we could because they have substantially greater resources. Uncertainties resulting from the initiation and continuation of any patent litigation could limit our ability to continue our operations.

If our technology infringes the intellectual property of our competitors or other third parties, we may be required to pay license fees or damages.

If any relevant claims of third-party patents that are adverse to us are upheld as valid and enforceable, we could be prevented from commercializing our technology or could be required to obtain licenses from the owners of such patents. We cannot assure you that such licenses would be available or, if available, would be on acceptable terms. Some licenses may be non-exclusive and, therefore, our competitors may have access to the same technology licensed to us. In addition, if any parties successfully claim that the creation or use of our technology infringes upon their intellectual property rights, we may be forced to pay damages, including treble damages.

Our security measures may not adequately protect our unpatented technology and, if we are unable to protect the confidentiality of our proprietary information and know-how, the value of our technology may be adversely affected.

Our success depends upon know-how, unpatentable trade secrets, and the skills, knowledge and experience of our scientific and technical personnel. As a result, we require all employees to agree to a confidentiality provision that prohibits the disclosure of confidential information to anyone outside of our company, during the term of employment and thereafter. We also require all employees to disclose and assign to us the rights to their ideas, developments, discoveries and inventions. We also attempt to enter into similar agreements with our consultants, advisors and research collaborators. We cannot assure you that adequate protection for our trade secrets, know-how or other proprietary information against unauthorized use or disclosure will be available.

We occasionally provide information to research collaborators in academic institutions and request the collaborators to conduct certain tests. We cannot assure you that the academic institutions will not assert intellectual property rights in the results of the tests conducted by the research collaborators, or that the academic institutions will grant licenses under such intellectual property rights to us on acceptable terms, if at all. If the assertion of intellectual property rights by an academic institution is substantiated, and the academic institution does not grant intellectual property rights to us, these events could limit our ability to commercialize our technology.

As we evolve from a company primarily involved in the research and development of our technology into one that is also involved in the commercialization of our technology, we may have difficulty managing our growth and expanding our operations.

As our business grows, we may need to add employees and enhance our management, systems and procedures. We will need to successfully integrate our internal operations with the operations of our marketing partners, manufacturers, distributors and suppliers to produce and market commercially viable products. We may also need to manage additional relationships with various collaborative partners,

suppliers and other organizations. Although we do not presently conduct research and development activities in-house, we may undertake those activities in the future. Expanding our business will place a significant burden on our management and operations. We may not be able to implement improvements to our management information and control systems in an efficient and timely manner and we may discover deficiencies in our existing systems and controls. Our failure to effectively respond to changes may make it difficult for us to manage our growth and expand our operations.

We have no marketing or sales history and depend on third-party marketing partners. Any failure of these parties to perform would delay or limit our commercialization efforts.

We have no history of marketing, distributing or selling biotechnology products and we are relying on our ability to successfully establish marketing partners or other arrangements with third parties to market, distribute and sell a commercially viable product both here and abroad. Our business plan also envisions creating strategic alliances to access needed commercialization and marketing expertise. We may not be able to attract qualified sub-licensees, distributors or marketing partners, and even if qualified, these marketing partners may not be able to successfully market agricultural products or human health applications developed with our technology. If we fail to successfully establish distribution channels, or if our marketing partners fail to provide adequate levels of sales, our commercialization efforts will be delayed or limited and we will not be able to generate revenue.

We will depend on joint ventures and strategic alliances to develop and market our technology and, if these arrangements are not successful, our technology may not be developed and the expenses to commercialize our technology will increase.

In its current state of development, our technology is not ready to be marketed to consumers. We intend to follow a multi-faceted commercialization strategy that involves the licensing of our technology to business partners for the purpose of further technological development, marketing and distribution. We are seeking business partners who will share the burden of our development costs while our technology is still being developed, and who will pay us royalties when they market and distribute products incorporating our technology upon commercialization. The establishment of joint ventures and strategic alliances may create future competitors, especially in certain regions abroad where we do not pursue patent protection. If we fail to establish beneficial business partners and strategic alliances, our growth will suffer and the continued development of our technology may be harmed.

Competition in the human health and agricultural biotechnology industries is intense and technology is changing rapidly. If our competitors market their technology faster than we do, we may not be able to generate revenues from the commercialization of our technology.

Many human health and agricultural biotechnology companies are engaged in research and development activities relating to senescence and apoptosis. The market for plant protection and yield enhancement products is intensely competitive, rapidly changing and undergoing consolidation. We may be unable to compete successfully against our current and future competitors, which may result in price reductions, reduced margins and the inability to achieve market acceptance for products containing our technology. Our competitors in the field of plant senescence gene technology are companies that develop and produce transgenic plants and include major international agricultural companies, specialized biotechnology companies, research and academic institutions and, potentially, our joint venture and strategic alliance partners. These companies include: Icoria (formerly Paradigm Genetics); Mendel Biotechnology; Renessen LLC; Exelixis Plant Sciences, Inc.; Syngenta International AG; and Eden Bioscience, among others. Some of our competitors that are involved in apoptosis research include: Amgen; Centocor; Genzyme; OSI Pharmaceuticals, Inc.; Novartis; Introgen Therapeutics, Inc.; Genta, Inc.; and Vertex Pharmaceuticals, Inc. Many of these competitors have substantially greater financial, marketing, sales, distribution and technical resources than us and have more experience in research and development, clinical trials, regulatory matters, manufacturing and marketing. We anticipate increased competition in the future as new companies enter the market and new technologies become available. Our technology may be rendered obsolete or uneconomical by technological advances or entirely different

approaches developed by one or more of our competitors, which will prevent or limit our ability to generate revenues from the commercialization of our technology.

Our business is subject to various government regulations and, if we are unable to obtain regulatory approval, we may not be able to continue our operations.

At present, the U.S. federal government regulation of biotechnology is divided among three agencies:

- the USDA regulates the import, field testing and interstate movement of specific types of genetic engineering that may be used in the creation of transgenic plants;

- the EPA regulates activity related to the invention of plant pesticides and herbicides, which may include certain kinds of transgenic plants; and

- the FDA regulates foods derived from new plant varieties.

The FDA requires that transgenic plants meet the same standards for safety that are required for all other plants and foods in general. Except in the case of additives that significantly alter a food s structure, the FDA does not require any additional standards or specific approval for genetically engineered foods, but expects transgenic plant developers to consult the FDA before introducing a new food into the marketplace.

Use of our technology, if developed for human health applications, will also be subject to FDA regulation. The FDA must approve any drug or biologic product before it can be marketed in the United States. In addition, prior to being sold outside of the U.S., any products resulting from the application of our human health technology must be approved by the regulatory agencies of foreign governments. Prior to filing a new drug application or biologics license application with the FDA, we would have to perform extensive clinical trials, and prior to beginning any clinical trial, we need to perform extensive preclinical testing which could take several years and may require substantial expenditures.

We believe that our current activities, which to date have been confined to research and development efforts, do not require licensing or approval by any governmental regulatory agency. However, federal, state and foreign regulations relating to crop protection products and human health applications developed through biotechnology are subject to public concerns and political circumstances, and, as a result, regulations have changed and may change substantially in the future. Accordingly, we may become subject to governmental regulations or approvals or become subject to licensing requirements in connection with our research and development efforts. We may also be required to obtain such licensing or approval from the governmental regulatory agencies described above, or from state agencies, prior to the commercialization of our genetically transformed plants and human health technology. In addition, our marketing partners who utilize our technology or sell products grown with our technology may be subject to government regulations. If unfavorable governmental regulations are imposed on our technology or if we fail to obtain licenses or approvals in a timely manner, we may not be able to continue our operations.

Preclinical studies and clinical trials of our human health applications may be unsuccessful, which could delay or prevent regulatory approval.

Preclinical studies may reveal that our human health technology is ineffective or harmful, and/or clinical trials may be unsuccessful in demonstrating efficacy and safety of our human health technology, which would significantly limit the possibility of obtaining regulatory approval for any drug or biologic product manufactured with our technology. The FDA requires submission of extensive preclinical, clinical and manufacturing data to assess the efficacy and safety of potential products. Furthermore, the success of preliminary studies does not ensure commercial success, and later-stage clinical trials may fail to confirm the results of the preliminary studies.

Even if we receive regulatory approval, consumers may not accept products containing our technology, which will prevent us from being profitable since we have no other source of revenue.

We cannot guarantee that consumers will accept products containing our technology. Recently, there has been consumer concern and consumer advocate activism with respect to genetically engineered consumer products. The adverse consequences from heightened consumer concern in this regard could affect the markets for products developed with our technology and could also result in increased government regulation in response to that concern. If the public or potential customers perceive our technology to be genetic modification or genetic engineering, agricultural products grown with our technology may not gain market acceptance.

We depend on our key personnel and, if we are not able to attract and retain qualified scientific and business personnel, we may not be able to grow our business or develop and commercialize our technology.

We are highly dependent on our scientific advisors, consultants and third-party research partners. Our success will also depend in part on the continued service of our key employees and our ability to identify, hire and retain additional qualified personnel in an intensely competitive market. Although we have employment agreements with all of our key employees and a research agreement with Dr. Thompson, these agreements may be terminated upon short or no notice. We do not maintain key person life insurance on any member of management. The failure to attract and retain key personnel could limit our growth and hinder our research and development efforts.

Certain provisions of our charter, by-laws and Delaware law could make a takeover difficult.

Certain provisions of our certificate of incorporation and by-laws could make it more difficult for a third party to acquire control of us, even if the change in control would be beneficial to stockholders. Our certificate of incorporation authorizes our board of directors to issue, without stockholder approval, except as may be required by the rules of the American Stock Exchange, 5,000,000 shares of preferred stock with voting, conversion and other rights and preferences that could adversely affect the voting power or other rights of the holders of our common stock. Similarly, our by-laws do not restrict our board of directors from issuing preferred stock without stockholder approval.

In addition, we are subject to the Business Combination Act of the Delaware General Corporation Law which, subject to certain exceptions, restricts certain transactions and business combinations between a corporation and a stockholder owning 15% or more of the corporation s outstanding voting stock for a period of three years from the date such stockholder becomes a 15% owner. These provisions may have the effect of delaying or preventing a change of control of us without action by our stockholders and, therefore, could adversely affect the value of our common stock.

Furthermore, in the event of our merger or consolidation with or into another corporation, or the sale of all or substantially all of our assets in which the successor corporation does not assume outstanding options or issue equivalent options, our board of directors is required to provide accelerated vesting of outstanding options.

Increasing political and social turmoil, such as terrorist and military actions, increase the difficulty for us and our strategic partners to forecast accurately and plan future business activities.

Recent political and social turmoil, including the conflict in Iraq and the current crisis in the Middle East, can be expected to put further pressure on economic conditions in the United States and worldwide. These political, social and economic conditions may make it difficult for us to plan future business activities. Specifically, if the current situation in Israel continues to escalate, our joint venture with Rahan Meristem Ltd. could be adversely affected.

Risks Related to Our Common Stock

Our management and other affiliates have significant control of our common stock and could significantly influence our actions in a manner that conflicts with our interests and the interests of other stockholders.

As of June 30, 2007, our executive officers, directors and affiliated entities together beneficially own approximately 38.9% of the outstanding shares of our common stock, assuming the exercise of options and warrants which are currently exercisable or will become exercisable within 60 days of June 30, 2007, held by these stockholders. As a result, these stockholders, acting together, will be able to exercise significant influence over matters requiring approval by our stockholders, including the election of directors, and may not always act in the best interests of other stockholders. Such a concentration of ownership may have the effect of delaying or preventing a change in control of us, including transactions in which our stockholders might otherwise receive a premium for their shares over then current market prices.

A significant portion of our total outstanding shares of common stock may be sold in the market in the near future, which could cause the market price of our common stock to drop significantly.

As of June 30, 2007, we had 17,473,694 shares of our common stock issued and outstanding, of which approximately 1,986,306 shares are registered pursuant to a registration statement on Form S-3, which was declared effective on November 27, 2006, and the remainder of which are either eligible to be sold under SEC Rule 144 or are in the public float. In addition, we have registered 2,701,715 shares of our Common Stock underlying warrants previously issued on the Form S-3 registration statement that was declared effective on November 27, 2006, and we registered 6,000,000 shares of our common stock underlying options granted or to be granted under our stock option plan. Consequently, sales of substantial amounts of our common stock in the public market, or the perception that such sales could occur, may have a material adverse effect on our stock price.

Our common stock has a limited trading market, which could limit your ability to resell your shares of common stock at or above your purchase price.

Our common stock is quoted on the American Stock Exchange and currently has a limited trading market. The American Stock Exchange requires us to meet minimum financial requirements in order to maintain our listing. Currently, we do not meet the continued listing requirements of the American Stock Exchange We cannot assure you that an active trading market will develop or, if developed, will be maintained. As a result, our stockholders may find it difficult to dispose of shares of our common stock and, as a result, may suffer a loss of all or a substantial portion of their investment.

We currently do not meet the American Stock Exchange continued listing standards. If our common stock is delisted from the American Stock Exchange, we may not be able to list on any other stock exchange, and our common stock may be subject to the penny stock regulations which may affect the ability of our stockholders to sell their shares.

The American Stock Exchange requires us to meet minimum financial requirements in order to maintain our listing. Currently, we do not meet the $6,000,000 minimum net worth continued listing requirement of the American Stock Exchange and have received a notice of noncompliance from the American Stock Exchange. We have submitted a plan to the American Stock Exchange discussing how we intend to regain compliance with the continued listing requirements. The American Stock Exchange has accepted our plan and has given us until March 1, 2008 to effectuate the plan and regain compliance with the continued listing requirements. If we are unable to execute on the plan, it is possible that we will be delisted. If we are delisted from the American Stock Exchange, our common stock likely will become a penny stock. In general, regulations of the SEC define a penny stock to be an equity security that is not listed on a national securities exchange or the NASDAQ Stock Market and that has a market price of less than $5.00 per share or with an exercise price of less than $5.00 per share, subject to certain exceptions. If our common stock becomes a penny stock, additional sales practice requirements would be imposed on broker-dealers that sell such securities to persons other than certain qualified investors. For transactions involving a penny stock, unless exempt, a broker-dealer must make a special suitability determination for the purchaser and receive the purchaser s written consent to the transaction prior to the

sale. In addition, the rules on penny stocks require delivery, prior to and after any penny stock transaction, of disclosures required by the SEC.

If our stock is not accepted for listing on the American Stock Exchange, we will make every possible effort to have it listed on the Over the Counter Bulletin Board, or the OTC Bulletin Board. If our common stock were to be traded on the OTC Bulletin Board, the Securities Exchange Act of 1934, as amended, and related Securities and Exchange Commission (SEC) rules would impose additional sales practice requirements on broker-dealers that sell our securities. These rules may adversely affect the ability of stockholders to sell our common stock and otherwise negatively affect the liquidity, trading market and price of our common stock.

We believe that the listing of our common stock on a recognized national trading market, such as the American Stock Exchange, is an important part of our business and strategy. Such a listing helps our stockholders by providing a readily available trading market with current quotations. Without that, stockholders may have a difficult time getting a quote for the sale or purchase of our stock, the sale or purchase of our stock would likely be made more difficult and the trading volume and liquidity of our stock would likely decline. The absence of such a listing may adversely affect the acceptance of our common stock as currency or the value accorded it by other parties. In that regard, the absence of a listing on a recognized national trading market will also affect our ability to benefit from the use of our operations and expansion plans, including for use in licensing agreements, joint ventures, the development of strategic relationships and acquisitions, which are critical to our business and strategy and none of which is currently the subject of any agreement, arrangement or understanding, with respect to any future financing or strategic relationship it may undertake. The delisting from the American Stock Exchange would result in negative publicity and would negatively impact our ability to raise capital in the future.

The market price of our common stock may fluctuate and may drop below the price you paid.

We cannot assure you that you will be able to resell the shares of our common stock at or above your purchase price. The market price of our common stock may fluctuate significantly in response to a number of factors, some of which are beyond our control. These factors include:

- quarterly variations in operating results;
- the progress or perceived progress of our research and development efforts;
- changes in accounting treatments or principles;
- announcements by us or our competitors of new technology, product and service offerings, significant contracts, acquisitions or strategic relationships;
- additions or departures of key personnel;
- future offerings or resales of our common stock or other securities;
- stock market price and volume fluctuations of publicly-traded companies in general and development companies in particular; and
- general political, economic and market conditions.

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

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

Risks Related to the Offering

Our stockholders may experience substantial dilution as a result of the conversion of outstanding convertible debentures, or the exercise of options and warrants to purchase our common stock.

As of June 30, 2007, we have granted options outside of our stock option plan to purchase 10,000 shares of our common stock and outstanding warrants to purchase 5,134,815 shares of our common stock. In addition, as of June 30, 2007, we have reserved 6,000,000 shares of our common stock for issuance upon the exercise of options granted pursuant to our stock option plan, 2,754,500 of which have been granted, 90,000 of which have been exercised since inception, 2,646,000 of which are outstanding, and 3,264,000 of which may be granted in the future. The exercise of these options and warrants will result in dilution to our existing stockholders and could have a material adverse effect on our stock price. In addition, any shares issued in connection with the YA Global or Stanford financings, as further discussed elsewhere in this prospectus, can also have a dilutive effect and a possible material adverse effect on our stock price. The conversion price of the convertible debentures is subject to adjustment if certain milestones are not met, and the warrants are also subject to certain anti-dilution adjustments. The agreements with YA Global Investments, L.P. and Stanford Venture Capital Holdings, Inc. provide for the potential issuance of up to 62,388,888 shares of our common stock.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus includes and incorporates forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1955, Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934 based upon the beliefs of our management, as well as assumptions made by, and the information currently available to, our management. All statements, other than statements of historical facts, included or incorporated in this prospectus regarding our strategy, future operations, financial position, future revenues, projected costs, prospects, plans and objectives of management are forward-looking statements. The words anticipates, believes, estimates, expects, intends, may, plans, projects, will, would and similar expressions are intended to identify forward-looking statements, althoug forward-looking statements contain these identifying words. We cannot assure you that we actually will achieve the plans, intentions or expectations disclosed in our forward-looking statements and you should not place undue reliance on our forward-looking statements. Actual results or events could differ materially from the plans, intentions and expectations disclosed in the forward-looking statements we make. We have included important factors in the cautionary statements included or incorporated in this prospectus, particularly under the heading Risk Factors, that we believe could cause actual results or events to differ materially from the forward-looking statements that we make. Our forward-looking statements do not reflect the potential impact of any future acquisitions, mergers, dispositions, joint ventures or investments we may make. You are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date of this prospectus. Except for special circumstances in which a duty to update arises when prior disclosure becomes materially misleading in light of subsequent circumstances, we do not intend to update any of these forward-looking statements to reflect events or circumstances after the date of this prospectus or to reflect the occurrence of unanticipated events.

USE OF PROCEEDS

We will not receive any proceeds from the sale of common stock by the selling stockholders.

The selling stockholders will pay any underwriting discounts and commissions and expenses incurred by the selling stockholders in disposing of the shares. We will bear all other costs, fees and expenses incurred in effecting the issuance and registration of the shares covered by this prospectus, including, without limitation, all registration and filing fees, American Stock Exchange listing fees and fees and expenses of our counsel and our accountants.

SELLING STOCKHOLDERS

The following table sets forth, to our knowledge, the common stock ownership of the selling stockholders, as of September 30, 2007, as adjusted to reflect the sale of the common stock in this offering. The shares of common stock being offered by the selling stockholders are issuable upon conversion of the convertible debentures. We are registering the shares of common stock in order to permit the selling stockholders to offer the shares for resale from time to time. Except as described in this prospectus, the selling stockholders have not held any position or office or had any other material relationship with us or any of our predecessors or affiliates within the past three years.

The 3,333,333 shares covered by this prospectus represent approximately 19.1% of our common stock, based on 17,473,694 shares of common stock outstanding as of June 30, 2007. The 3,333,333 shares are issuable upon conversion of the convertible debentures held by the selling stockholders. We considered the following factors and made the following assumptions regarding the table:

- beneficial ownership is determined under Section 13(d) of the Securities Exchange Act of 1934 and generally includes voting or investment power with respect to securities and including any securities that grant the selling stockholder the right to acquire common stock within 60 days of September 30, 2007;

- unless otherwise indicated below, to our knowledge, the selling stockholders named below have sole voting and investment power with respect to their shares of common stock, except to the extent authority is shared by spouses under applicable law; and

- the selling stockholders may sell all of the securities offered by this prospectus under certain circumstances.

Notwithstanding these assumptions, the selling stockholders may sell less than all of the shares listed on the table. In addition, the shares listed below may be sold pursuant to this prospectus or in privately negotiated transactions. Accordingly, we cannot estimate the number of shares of common stock that the selling stockholders will sell under this prospectus.

Under the terms of the convertible debentures and the warrants, a selling stockholder may not convert the convertible debentures or exercise the warrants to the extent such conversion or exercise would cause such selling stockholder, together with its affiliates, to beneficially own a number of shares of common stock which would exceed 4.99% of our then outstanding shares of common stock following such conversion or exercise, excluding for purposes of such determination shares of common stock issuable upon conversion of the convertible debentures which have not been converted and upon exercise of the warrants which have not been exercised.

Each of the selling stockholders listed below has sole voting and investment power with respect to the shares beneficially owned by the stockholder unless noted otherwise, subject to community property laws where applicable.

	Beneficial Ownership of Selling Stockholders Prior to Offering(1)			Number of Shares Offered Hereby(2)	Beneficial Ownership of Shares After Offering(2)(3)		
Name of Selling Stockholders	**Number**	**Percent**		**Number**	**Number**	**Percent**	
YA Global Investments, L.P. (4)	6,108,333	25.9	%	3,333,333	2,775,000	13.7	%

(1) Shares of common stock issuable under warrants that are exercisable within 60 days after September 30, 2007 and shares of common stock issuable under warrants held by the selling stockholder are deemed outstanding for computing the percentage ownership of the selling stockholder holding the warrants, prior to and after giving effect to the offering, but are not deemed outstanding for computing the percentage ownership of any other selling stockholder.

(2) We do not know when or in what amounts a selling stockholder may offer shares for sale. The selling stockholders might not sell any or all of the shares offered by this prospectus. Because the selling stockholders may offer all or some of the shares pursuant to this offering and because there are currently no agreements, arrangements or understandings with respect to the sale of any of the shares, we cannot estimate the number of the shares that will be held by the selling stockholders after completion of the offering. However, for purposes of this table, we have assumed that, after completion of the offering, none of the shares covered by this prospectus will be held by the selling stockholders.

(3) Shares of common stock issuable under warrants that are exercisable within 60 days after September 30, 2007 are deemed outstanding for computing the percentage ownership of the selling stockholder holding the warrants, prior to and after giving effect to the offering, but are not deemed outstanding for computing the percentage ownership of any other selling stockholder.

(4) YA Global Investments, L.P. is a Cayman Island exempt limited partnership. YA Global Investments, L.P. is managed by Yorkville Advisors, LLC. Investment decisions for Yorkville Advisors are made by Mark Angelo, its portfolio manager.

PLAN OF DISTRIBUTION

Each selling stockholder of the common stock and any of their pledgees, assignees and successors-in-interest may, from time to time, sell any or all of their shares of common stock on the American Stock Exchange or any other stock exchange, market or trading facility on which the shares are traded or in private transactions. These sales may be at fixed or negotiated prices. A selling stockholder may use any one or more of the following methods when selling shares:

- ordinary brokerage transactions and transactions in which the broker-dealer solicits purchasers;
- block trades in which the broker-dealer will attempt to sell the shares as agent but may position and resell a portion of the block as principal to facilitate the transaction;
- purchases by a broker-dealer as principal and resale by the broker-dealer for its account;
- an exchange distribution in accordance with the rules of the applicable exchange;
- privately negotiated transactions;
- broker-dealers may agree with the selling stockholders to sell a specified number of such shares at a stipulated price per share;
- through the writing or settlement of options or other hedging transactions, whether through an options exchange or otherwise;
- a combination of any such methods of sale; or
- any other method permitted pursuant to applicable law.

The selling stockholders may also sell shares under Rule 144 under the Securities Act of 1933, as amended (the Securities Act), if available, rather than under this prospectus.

Broker-dealers engaged by the selling stockholders may arrange for other brokers-dealers to participate in sales. Broker-dealers may receive commissions or discounts from the selling stockholders (or, if any broker-dealer acts as agent for the purchaser of shares, from the purchaser) in amounts to be negotiated, but, except as set forth in a supplement to this prospectus, in the case of an agency transaction not in excess of a customary brokerage commission in compliance with NASDR Rule 2440; and in the case of a principal transaction a markup or markdown in compliance with NASDR IM-2440.

In connection with the sale of the common stock or interests therein, the selling stockholders may enter into hedging transactions with broker-dealers or other financial institutions, which may in turn engage in short sales of the common stock in the course of hedging the positions they assume. The selling stockholders may also enter into option or other transactions with broker-dealers or other financial institutions or the creation of one or more derivative securities which require the delivery to such broker-dealer or other financial institution of shares offered by this prospectus, which shares such broker-dealer or other financial institution may resell pursuant to this prospectus (as supplemented or amended to reflect such transaction).

The selling stockholders and any broker-dealers or agents that are involved in selling the shares may be deemed to be underwriters within the meaning of the Securities Act in connection with such sales. In such event, any commissions received by such broker-dealers or agents and any profit on the resale of the shares purchased by them may be deemed to be underwriting commissions or discounts under the Securities Act. Each selling stockholder has informed us that it does not have any written or oral agreement or understanding, directly or indirectly, with any person to distribute the common stock. In no event shall any broker-dealer receive fees, commissions and markups which, in the aggregate, would exceed eight percent (8%).

We are required to pay certain fees and expenses incident to the registration of the shares. We have agreed to indemnify the selling stockholders against certain losses, claims, damages and liabilities, including liabilities under the Securities Act.

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Because selling stockholders may be deemed to be underwriters within the meaning of the Securities Act, they will be subject to the prospectus delivery requirements of the Securities Act including Rule 172 thereunder. In addition, any securities covered by this prospectus which qualify for sale pursuant to Rule 144 under the Securities Act may be sold under Rule 144 rather than under this prospectus. There is no underwriter or coordinating broker acting in connection with the proposed sale of the resale shares by the selling stockholders.

We agreed to keep this prospectus effective until the earlier of (i) the date on which the shares may be resold by the selling stockholders without registration and without regard to any volume limitations by reason of Rule 144(k) under the Securities Act or any other rule of similar effect or (ii) all of the shares have been sold pursuant to this prospectus or Rule 144 under the Securities Act or any other rule of similar effect. The resale shares will be sold only through registered or licensed brokers or dealers if required under applicable state securities laws. In addition, in certain states, the resale shares may not be sold unless they have been registered or qualified for sale in the applicable state or an exemption from the registration or qualification requirement is available and is complied with.

Under applicable rules and regulations under the Exchange Act, any person engaged in the distribution of the resale shares may not simultaneously engage in market making activities with respect to the common stock for the applicable restricted period, as defined in Regulation M, prior to the commencement of the distribution. In addition, the selling stockholders will be subject to applicable provisions of the Exchange Act and the rules and regulations thereunder, including Regulation M, which may limit the timing of purchases and sales of shares of the common stock by the selling stockholders or any other person. We will make copies of this prospectus available to the selling stockholders and have informed them of the need to deliver a copy of this prospectus to each purchaser at or prior to the time of the sale (including by compliance with Rule 172 under the Securities Act).

LEGAL MATTERS

The validity of the shares of common stock offered by this prospectus has been passed upon for us by Morgan, Lewis & Bockius LLP, Princeton, New Jersey.

EXPERTS

The audited consolidated financial statements incorporated by reference in this prospectus and elsewhere in the registration statement have been audited by Goldstein Golub Kessler LLP, independent public accountants, as indicated in their report with respect thereto, and are incorporated by reference in reliance upon the authority of said firm as experts in accounting and auditing in giving said report.

WHERE YOU CAN FIND MORE INFORMATION

We file reports, proxy statements and other documents with the SEC. You may read and copy any document we file at the SEC s public reference room at Judiciary Plaza Building, 450 Fifth Street, N.W., Room 1024, Washington, D.C. 20549. You should call 1-800-SEC-0330 for more information on the public reference room. Our SEC filings are also available to you on the SEC s Internet site at http://www.sec.gov.

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

INCORPORATION BY REFERENCE

The SEC allows us to incorporate by reference much of the information we file with them (former Commission File No. 0-22307 and current Commission File No. 001-31326), which means that we can disclose important information to you by referring you to those publicly available documents. The information that we incorporate by reference is considered to be part of this prospectus, and any of our subsequent filings with the SEC will automatically update and supersede this information. This prospectus incorporates by reference the documents listed below and any future filings made by us with the SEC under Sections 13(a), 13(c), 14 or 15(d) of the Securities Exchange Act of 1934, as amended, until the filing of a post-effective amendment to this prospectus which indicates that all securities registered have been sold or which deregisters all securities then remaining unsold:

- our annual report on Form 10-K for the fiscal year ended June 30, 2007, filed on September 28, 2007;
- our current report on Form 8-K, dated June 29, 2007, filed on July 3, 2007;
- our current report on Form 8-K, dated July 16, 2007, filed on July 17, 2007;
- our current report on Form 8-K, dated July 23, 2007, filed on July 25, 2007;
- our current report on Form 8-K, dated August 1, 2007, filed on August 7, 2007;
- our current report on Form 8-K, dated August 6, 2007, filed on August 9, 2007;
- our current report on Form 8-K, dated August 24, 2007 filed on August 28, 2007;
- our current report on Form 8-K, dated August 29, 2007 filed on September 4, 2007;
- our current report on Form 8-K, dated September 11, 2007 filed on September 11, 2007;

- our current report on Form 8-K, dated September 17, 2007 filed on September 19, 2007;
- our current report on Form 8-K, dated September 21, 2007 filed on September 26, 2007;
- our proxy statement filed on October 28, 2006 for our annual meeting of stockholders held on December 14, 2006; and
- all of our filings pursuant to the Securities Exchange Act of 1934, as amended, after the date of filing the initial registration statement and prior to effectiveness of the registration statement.

You may request a copy of any or all of these filings, at no cost, by writing or telephoning us at: Senesco Technologies, Inc., 303 George Street, Suite 420, New Brunswick, New Jersey 08901; telephone (732) 296-8400, attention: Joel Brooks.

You should rely only on the information incorporated by reference or provided in this prospectus or any supplement. We have not authorized anyone else to provide you with different information. The selling stockholders will not make an offer of these shares in any state where the offer is not permitted. You should not assume that information in this prospectus or any supplement is accurate as of any date other than the date on the front of these documents.

INDEMNIFICATION OF DIRECTORS AND OFFICERS

Section 145 of the Delaware General Corporation Law empowers a Delaware corporation to indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (other than an action by or in the right of such corporation) by reason of the fact that such person is or was a director, officer, employee or agent of such corporation, or is or was serving at the request of such corporation as a director, officer, employee or agent of another corporation or enterprise. A corporation may, in advance of the final disposition of any civil, criminal, administrative or investigative action, suit or proceeding, pay the expenses (including attorneys fees) incurred by any officer, director, employee or agent in defending such action, provided that the director or officer undertakes to repay such amount if it shall ultimately be determined that he is not entitled to be indemnified by the corporation. A corporation may indemnify such person against expenses (including attorneys fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by such person in connection with such action, suit or proceeding if he acted in good faith and in a manner he reasonably believed to be in or not opposed to the best interests of the corporation, and, with respect to any criminal action or proceeding, had no reasonable cause to believe his conduct was unlawful.

A Delaware corporation may indemnify officers and directors in an action by or in the right of the corporation to procure a judgment in its favor under the same conditions, except that no indemnification is permitted without judicial approval if the officer or director is adjudged to be liable to the corporation. Where an officer or director is successful on the merits or otherwise in the defense of any action referred to above, the corporation must indemnify him against the expenses (including attorneys fees) which he actually and reasonably incurred in connection therewith. The indemnification provided is not deemed to be exclusive of any other rights to which an officer or director may be entitled under any corporation s by-law, agreement, vote or otherwise.

Our certificate of incorporation includes a provision that eliminates the personal liability of our directors to us or our stockholders for monetary damages for breach of their fiduciary duty to the maximum extent permitted by the DGCL. The DGCL does not permit liability to be eliminated (i) for any breach of a director s duty of loyalty to us or our stockholders, (ii) for acts or omissions not in good faith or that involve intentional misconduct or a knowing violation of law, (iii) for unlawful payments of dividends or unlawful stock repurchases or redemptions, as provided in Section 174 of the DGCL, or (iv) for any transaction from which the director derived an improper personal benefit. In addition, as permitted in Section 145 of the DGCL, our certificate of incorporation and by-laws provide that we shall indemnify our directors and officers to the fullest extent permitted by the DGCL, including those circumstances in which indemnification would otherwise be discretionary, subject to certain exceptions. Our by-laws also provide that we shall advance expenses to directors and officers incurred in connection with an action or proceeding as to which they may be entitled to indemnification, subject to certain exceptions.

Each of our indemnification agreements with each of our executive officers and directors provides for indemnification to the maximum extent permitted by applicable law. We also indemnify each of our directors and executive officers with the maximum indemnification allowed to directors and executive officers by the DGCL, subject to certain exceptions, as well as certain additional procedural protections. In addition, we will generally advance expenses incurred by directors and executive officers in any action or proceeding as to which they may be entitled to indemnification, subject to certain exceptions.

The indemnification provisions in our certificate of incorporation and by-laws also permit indemnification for liabilities arising under the Securities Act of 1933. Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers and controlling persons pursuant to the foregoing provisions, or otherwise, we have been advised that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act of 1933 and is, therefore, unenforceable.

We currently carry director and officer liability insurance in the amount of $4,000,000.

PART II

INFORMATION NOT REQUIRED IN PROSPECTUS

Item 14. Other Expenses of Issuance and Distribution.

The expenses payable by the registrant in connection with the issuance and distribution of the securities being registered hereby are as follows:

	Amount	
SEC Registration Fee	$ 76	
Amex Additional Listing Fee	$ 65,000	
Legal Expenses	$ 25,000	*
Accounting Expenses	$ 5,000	*
Printing Expenses	$ 2,000	*
Miscellaneous Expenses	$ 2,924	*
Total	$ 100,000	*

*Estimated

Item 15. Indemnification of Directors and Officers.

Section 145 of the Delaware General Corporation Law empowers a Delaware corporation to indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (other than an action by or in the right of such corporation) by reason of the fact that such person is or was a director, officer, employee or agent of such corporation, or is or was serving at the request of such corporation as a director, officer, employee or agent of another corporation or enterprise. A corporation may, in advance of the final disposition of any civil, criminal, administrative or investigative action, suit or proceeding, pay the expenses (including attorneys fees) incurred by any officer, director, employee or agent in defending such action, provided that the director or officer undertakes to repay such amount if it shall ultimately be determined that he is not entitled to be indemnified by the corporation. A corporation may indemnify such person against expenses (including attorneys fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by such person in connection with such action, suit or proceeding if he acted in good faith and in a manner he reasonably believed to be in or not opposed to the best interests of the corporation, and, with respect to any criminal action or proceeding, had no reasonable cause to believe his conduct was unlawful.

A Delaware corporation may indemnify officers and directors in an action by or in the right of the corporation to procure a judgment in its favor under the same conditions, except that no indemnification is permitted without judicial approval if the officer or director is adjudged to be liable to the corporation. Where an officer or director is successful on the merits or otherwise in the defense of any action referred to above, the corporation must indemnify him against the expenses (including attorneys fees) which he actually and reasonably incurred in connection therewith. The indemnification provided is not deemed to be exclusive of any other rights to which an officer or director may be entitled under any corporation s by-law, agreement, vote or otherwise.

Our certificate of incorporation includes a provision that eliminates the personal liability of our directors to us or our stockholders for monetary damages for breach of their fiduciary duty to the maximum extent permitted by the DGCL. The DGCL does not permit liability to be eliminated (i) for any breach of a director s duty of loyalty to us or our stockholders, (ii) for acts or omissions not in good faith or that involve intentional misconduct or a knowing violation of law, (iii) for unlawful payments of dividends or unlawful stock repurchases or redemptions, as provided in Section 174 of the DGCL, or (iv) for any

transaction from which the director derived an improper personal benefit. In addition, as permitted in Section 145 of the DGCL, our certificate of incorporation and by-laws provide that we shall indemnify our directors and officers to the fullest extent permitted by the DGCL, including those circumstances in which indemnification would otherwise be discretionary, subject to certain exceptions. Our by-laws also provide that we shall advance expenses to directors and officers incurred in connection with an action or proceeding as to which they may be entitled to indemnification, subject to certain exceptions.

Each of our indemnification agreements with each of our executive officers and directors provides for indemnification to the maximum extent permitted by applicable law. We also indemnify each of our directors and executive officers with the maximum indemnification allowed to directors and executive officers by the DGCL, subject to certain exceptions, as well as certain additional procedural protections. In addition, we will generally advance expenses incurred by directors and executive officers in any action or proceeding as to which they may be entitled to indemnification, subject to certain exceptions.

The indemnification provisions in our certificate of incorporation and by-laws also permit indemnification for liabilities arising under the Securities Act of 1933. Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers and controlling persons pursuant to the foregoing provisions, or otherwise, we have been advised that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act of 1933 and is, therefore, unenforceable.

We currently carry director and officer liability insurance in the amount of $4,000,000.

Item 16. Exhibits.

4.1	Form of Series A Warrant issued to YA Global Investments, L.P. Incorporated by reference to Exhibit 4.15 of our Annual Report on Form 10-K for the year ended June 30, 2007, filed on September 28, 2007.
4.2	Form of Series B Warrant issued to YA Global Investments, L.P. Incorporated by reference to Exhibit 4.19 of our Annual Report on Form 10-K for the year ended June 30, 2007, filed on September 28, 2007.
4.3	Form of Convertible Debenture issued to YA Global Investments, L.P. Incorporated by reference to Exhibit 4.17 of our Annual Report on Form 10-K for the year ended June 30, 2007, filed on September 28, 2007.
5.1*	Opinion of Morgan, Lewis & Bockius LLP.
10.1	Form of Securities Purchase Agreement issued YA Global Investments, L.P. Incorporated by reference to Exhibit 10.44 of our Annual Report on Form 10-K for the year ended June 30, 2007, filed on September 28, 2007.
10.2	Form of Registration Rights Agreement by and between Senesco Technologies, Inc. and YA Global Investments, L.P. Incorporated by reference to Exhibit 10.45 of our Annual Report on Form 10-K for the year ended June 30, 2007, filed on September 28, 2007.
23.1*	Consent of Goldstein Golub Kessler LLP.
23.2*	Consent of Morgan, Lewis & Bockius LLP (included in Exhibit 5.1).
24.1*	Power of Attorney (included on signature page).

* Filed herewith.

Item 17. Undertakings

(a) The undersigned registrant hereby undertakes:

(1) To file, during any period in which it offers or sells securities, a post-effective amendment to this registration statement:

(i) to include any prospectus required by section 10(a)(3) of Securities Act of 1933;

(ii) to reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or together, represent a fundamental change in the information in the registration statement. Notwithstanding the foregoing, any increase or decrease in the volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Securities and Exchange Commission, or the Commission, pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than a twenty percent change in the maximum aggregate offering price set forth in the Calculation of Registration Fee table in the effective registration statement; and

(iii) to include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement; provided, however, that

(A) paragraphs (1)(i) and (1)(ii) do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Commission by the registrant pursuant to Section 13 or Section 15(d) of the Securities Exchange Act of 1934, as amended, that are incorporated by reference in this registration statement; and

(B) paragraphs (1)(i), (1)(ii) and (1)(iii) do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Commission by the registrant pursuant to Section 13 or Section 15(d) of the Exchange Act of 1934, as amended, that are incorporated by reference in this registration statement, or is contained in a form of prospectus filed pursuant to Rule 424(b) that is a part of this registration statement.

(2) That, for the purpose of determining any liability under the Securities Act of 1933, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering.

(4) That, for the purpose of determining liability under the Securities Act to any purchaser:

(i) If the registrant is relying on Rule 430B:

(A) Each prospectus filed by the registrant pursuant to Rule 424(b)(3) shall be deemed to be part of this registration statement as of the date the filed prospectus was deemed part of and included in this registration statement; and

(B) Each prospectus required to be filed pursuant to Rule 424(b)(2), (b)(5) or (b)(7) as part of this registration statement or in reliance on Rule 430B relating to an offering made pursuant to Rule 415(a)(1)(i), (vii), or (x) for the purpose of providing the information required by Section 10(a) of the Securities Act shall be deemed to be part of and included in this registration statement as of the earlier of the date such form of prospectus is first used after effectiveness or the date of the first contract of sale of securities in the offering described in the prospectus. As provided in Rule 430B, for liability purposes of the issuer and any person that is at that date an underwriter, such date shall be deemed to be a new effective date of this registration statement relating to the securities in this registration statement to which that prospectus relates, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof. Provided, however, that no statement made in this registration statement or prospectus that is part of this registration statement or made in a document incorporated or deemed incorporated by reference into this registration statement or prospectus that is part of this registration statement will, as to a purchaser with a time of contract of sale prior to such effective date, supersede or modify any statement that was made in this registration statement or prospectus that was part of this registration statement or made in any such document immediately prior to such effective date; or

(ii) If the registrant is subject to Rule 430C, each prospectus filed pursuant to Rule 424(b) as part of a registration statement relating to an offering, other than registration statements relying on rule 430B or other than prospectuses filed in reliance on Rule 430A, shall be deemed to be part of and included in this registration statement as of the date it is first used after effectiveness. Provided, however, that no statement made in this registration statement or prospectus that is part of this registration statement or made in a document incorporated or deemed incorporated by reference into this registration statement or prospectus that is part of this registration statement will, as to a purchaser with a time of contract of sale prior to such first use, supersede or modify any statement that was made in this registration statement or prospectus that was part of this registration statement or made in any such document immediately prior to such date of first use.

(5) That, for the purpose of determining liability of the registrant under the Securities Act to any purchaser in the initial distribution of the securities:

The undersigned registrant undertakes that in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:

(i) Any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424;

(ii) Any free writing prospectus relating to the offering prepared by or on behalf of the undersigned registrant or used or referred to by the undersigned registrant;

(iii) The portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of the undersigned registrant; and

(iv) Any other communication that is an offer in the offering made by the undersigned registrant to the purchaser.

(b) The undersigned registrant hereby undertakes that, for purposes of determining any liability under the Securities Act, each filing of the registrant s annual report pursuant to Section 13(a) or Section 15(d) of the Securities Exchange Act of 1934 (and, where applicable, each filing of an employee benefit plan s annual report pursuant to Section 15(d) of the Exchange Act) that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(c) The undersigned registrant hereby undertakes that:

(i) For purposes of determining any liability under the Securities Act, the information omitted from the form of prospectus filed as part of this registration statement in reliance upon Rule 430A and contained in a form of prospectus filed by the registrant pursuant to Rule 424(b)(1) or (4) or 497(h) under the Securities Act shall be deemed to be part of this registration statement as of the time it was declared effective; and

(ii) For the purpose of determining any liability under the Securities Act, each post-effective amendment that contains a form of prospectus shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

(d) Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Act and will be governed by the final adjudication of such issue.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-3 and has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of New Brunswick, State of New Jersey, on October 12, 2007.

SENESCO TECHNOLOGIES, INC.

(Registrant)

By: /s/ Bruce C. Galton
Bruce C. Galton
President and Chief Executive Officer

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS, that each person whose signature appears below constitutes and appoints Bruce C. Galton and Joel Brooks, jointly and severally, his true and lawful attorneys-in-fact and agents, each with full power of substitution and resubstitution, for him and in his name, place and stead, in any and all capacities, to sign any and all amendments to this registration statement, and to file the same, with exhibits thereto, and other documents in connection therewith, with the SEC, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite or necessary to be done in and about the premises, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that each of said attorneys-in-fact and agents, or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, this registration statement has been signed below by the following persons in the capacities and on the dates indicated.

Signature	**Title**	**Date**
/s/ Bruce C. Galton Bruce C. Galton	President, Chief Executive Officer and Director	October 12, 2007
/s/ Joel Brooks Joel Brooks	Chief Financial Officer and Treasurer (Principal Financial and Accounting Officer)	October 12, 2007
/s/ Ruedi Stalder Ruedi Stalder	Chairman of the Board and Director	October 12, 2007
/s/ John E. Thompson John E. Thompson, Ph.D.	Executive Vice President of Research and Development and Director	October 12, 2007
/s/ Christopher Forbes Christopher Forbes	Director	October 12, 2007
/s/ Thomas C. Quick Thomas C. Quick	Director	October 12, 2007
/s/ David Rector David Rector	Director	October 12, 2007
/s/ John Braca John Braca	Director	October 12, 2007
/s/ Jack Van Hulst Jack Van Hulst	Director	October 12, 2007

Item 16. Exhibits.

4.1	Form of Series A Warrant issued to YA Global Investments, L.P. Incorporated by reference to Exhibit 4.15 of our Annual Report on Form 10-K for the year ended June 30, 2007, filed on September 28, 2007.
4.2	Form of Series B Warrant issued to YA Global Investments, L.P. Incorporated by reference to Exhibit 4.19 of our Annual Report on Form 10-K for the year ended June 30, 2007, filed on September 28, 2007.
4.3	Form of Convertible Debenture issued to YA Global Investments, L.P. Incorporated by reference to Exhibit 4.17 of our Annual Report on Form 10-K for the year ended June 30, 2007, filed on September 28, 2007.
5.1*	Opinion of Morgan, Lewis & Bockius LLP.
10.1	Form of Securities Purchase Agreement issued YA Global Investments, L.P. Incorporated by reference to Exhibit 10.44 of our Annual Report on Form 10-K for the year ended June 30, 2007, filed on September 28, 2007.
10.2	Form of Registration Rights Agreement by and between Senesco Technologies, Inc. and YA Global Investments, L.P. Incorporated by reference to Exhibit 10.45 of our Annual Report on Form 10-K for the year ended June 30, 2007, filed on September 28, 2007.
23.1*	Consent of Goldstein Golub Kessler LLP.
23.2*	Consent of Morgan, Lewis & Bockius LLP (included in Exhibit 5.1).
24.1*	Power of Attorney (included on signature page).

* Filed herewith.