Lightwave Logic, Inc.
Form POS AM
June 07, 2016

As Filed with the Securities and Exchange Commission on June 6, 2016 **Registration No. 333-198665**

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

POST EFFECTIVE AMENDMENT NO. 2
TO
FORM S-1

REGISTRATION STATEMENT UNDER THE SECURITIES ACT OF 1933

LIGHTWAVE LOGIC, INC.

(Name of Registrant As Specified in its Charter)

Nevada	**3080**	**82-049-7368**
(State or Other Jurisdiction of Incorporation or Organization)	*(Primary Standard Industrial Classification Code Number)*	*(I.R.S. Employer Identification No.)*

1831 Lefthand Circle, Suite C
Longmont, Colorado 80501
(720) 340-4949

(Address and Telephone Number of Principal Executive Offices)

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Approximate Date of Proposed Sale to the Public:

As soon as practicable after this Registration Statement becomes effective.

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, check the following box. þ

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: ¨

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: ¨

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

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of large accelerated filer, accelerated filer and smaller reporting company in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer ¨	Accelerated filer ¨	Non-accelerated filer ¨ *(Do not check if a smaller reporting company)*	Smaller reporting company þ

The Registrant 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 hereafter 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 Section 8(a), may determine.

EXPLANATORY NOTE

Lightwave Logic, Inc. (the Company) previously filed a Registration Statement on Form S-1 (File No. 333-198665) with the U.S. Securities and Exchange Commission (the SEC) on September 9, 2014 which was declared effective by the SEC on September 17, 2014 (the Original Registration Statement), which was subsequently amended by Post-Effective Amendment No. 1, which was filed with the SEC on June 16, 2015 and declared effective on June 22, 2015 (the Existing Registration Statement). The Existing Registration Statement registered for resale of up to 8,415,200 shares of common stock of the Company by selling securityholders. Of the shares of common stock being offered by the selling securityholders, 4,207,600 shares been previously issued pursuant to private placements and 4,207,600 shares are issuable upon the exercise of warrants held by the selling securityholders which were issued to the selling securityholders pursuant to the private placements.

The Company issued 4,207,600 shares of common stock and warrants to purchase 4,207,600 shares of common stock expiring five years from the date of purchase, for proceeds of $3,140,000 in accordance to a private placement memorandum as amended on May 27, 2014. Pursuant to the terms of the offerings, up to 60 units were offered at the purchase price of $50,000 per unit, with each unit comprised of 67,000 shares and a warrant to purchase 33,500 shares of common stock at $1.00 per share and a warrant to purchase 33,500 shares of common stock at $1.25 per share. As of the date of this prospectus, the warrants to purchase 2,103,800 shares of common stock at $1.00 per share are still outstanding and warrants to purchase 2,103,800 shares of common stock at $1.25 per share are still outstanding.

As of the date of this prospectus, the selling securityholders have sold 2,338,300 shares under the Existing Registration Statement, for which we have not received any proceeds. However, we may receive up to $4,733,550 from the exercise by the selling securityholders of 4,207,600 warrants (i.e., 2,103,800 warrants exercisable at $1.00 per share and 2,103,800 warrants exercisable at $1.25 per share), which remain outstanding as of the date of this prospectus.

This Registration Statement constitutes Post-Effective Amendment No. 2 to the Original Registration Statement and is being filed to update, among other things, the Company s audited financial statements for the fiscal years ended December 31, 2015 and 2014, pursuant to Section 10(a)(3) of the Securities Act of 1933, as amended, to include the information contained in the Company s Quarterly Report on Form 10-Q for the fiscal quarter ended March 31, 2016 and to reflect all sales of the Company s securities that have been made by the selling securityholders under the Existing Registration Statement as of the date hereof.

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

PRELIMINARY PROSPECTUS **SUBJECT TO COMPLETION** **June 6, 2016**

6,076,900 Shares

Common Stock

This prospectus relates to the sale of up to 6,076,900 shares of our common stock, par value $0.001 per share, which may be offered by the selling securityholders identified in this prospectus, from time to time. Of the shares of common stock being offered by the selling securityholders, 4,207,600 shares been previously issued pursuant to private placements and 4,207,600 shares are issuable upon the exercise of warrants held by the selling securityholders which were issued to the selling securityholders pursuant to the private placements.

As of the date of this prospectus, the selling securityholders have sold 2,338,300 shares under the Registration Statement to which this prospectus relates, for which we have not received any proceeds. However, we may receive up to $4,733,550 from the exercise by the selling securityholders of 4,207,600 warrants (i.e., 2,103,800 warrants exercisable at $1.00 per share and 2,103,800 warrants exercisable at $1.25 per share), which remain outstanding as of the date of this prospectus.

The registration of the shares hereunder does not mean that any of the selling securityholders will actually offer or sell the full number of the shares being registered pursuant to this prospectus. We will not receive any proceeds from the sales of shares of our common stock by the selling securityholders, however we may receive proceeds upon the

exercise of warrants held by the selling securityholders. Please refer to the section of this prospectus entitled The Private Placements for a description of the terms of the private placements and the section entitled Selling Securityholders for additional information on the selling securityholders.

The selling securityholders may sell the shares of common stock described in this prospectus in a number of different ways and at varying prices. Our common stock is currently quoted on the OTC Markets (OTCQB) under the symbol LWLG . On June 2, 2016, the last reported sale price of our common stock was $0.59 per share. See Plan of Distribution for more information about how the selling securityholders may sell the shares of common stock being registered pursuant to this prospectus.

We will pay the expenses incurred in registering the shares, including legal and accounting fees. See Plan of Distribution .

Investing in our securities involves a high degree of risk. See Risk Factors beginning on page 5 of this prospectus for a discussion of information that should be considered in connection with an investment in our securities.

Neither the Securities and Exchange Commission nor any state securities regulators have 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 _____ ___, 2016.

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You should rely only on the information contained in this prospectus. We have not, and the selling securityholders have not, authorized any person to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it. This prospectus is not an offer to sell, nor are the selling securityholders seeking an offer to buy, securities in any state where the offer or solicitation is not permitted. The information contained in this prospectus is complete and accurate as of the date on the front cover of this prospectus, but information may have changed since that date. We are responsible for updating this prospectus to ensure that all material information is included and will update this prospectus to the extent required by law.

This prospectus includes statistical and other industry and market data that we obtained from industry publications and research, surveys and studies conducted by third parties. Industry publications and third-party research, surveys and studies generally indicate that their information has been obtained from sources believed to be reliable, although they do not guarantee the accuracy or completeness of such information. While we believe that these industry publications and third-party research, surveys and studies are reliable, we have not independently verified such data and we do not

make any representation as to the accuracy of the information.

PROSPECTUS SUMMARY

The items in the following summary are described in more detail later in this prospectus. This summary does not contain all of the information you should consider. Before investing in our securities, you should read the entire prospectus carefully, including the Risk Factors beginning on page 5 and the financial statements and related notes beginning on page F-1. Unless the context otherwise requires, all references to the Company, we, our or us and ot similar terms means Lightwave Logic, Inc., a Nevada corporation.

Overview

Business

We are a development stage, electro-optical device and organic nonlinear materials company. Our primary area of expertise is the chemical synthesis of chromophore dyes used in the development of organic Application Specific Electro-Optic Polymers (ASEOP) and Organic Non-Linear All-Optical Polymers (NLAOP) that have high electro-optic and optical activity. Our family of materials is thermally and photo-chemically stable, which we believe could have utility across a broad range of applications in devices that address markets like, telecommunication, data communications, high-speed computing and photovoltaic cells. Secondarily, the company is developing proprietary electro-optical and all-optical devices utilizing the advanced capabilities of our materials for the application in the fields mentioned above.

Electro-optic devices convert data from electric signals into optical signals for use in communications systems and in optical interconnects for high-speed data transfer. We expect our patented and patent-pending optical materials, when completed and tested, to be the core of the future generations of optical devices, modules, sub-systems and systems that we will develop or be licensed by electro-optic device manufacturers, such as telecommunications component and systems manufacturers, networking and switching suppliers, semiconductor companies, aerospace companies and government agencies.

Our optical polymers (polymers) are property-engineered at the molecular level (nanotechnology level) to meet the exacting thermal, environmental and performance specifications demanded by electro-optic devices. We believe that our patented and patent pending technologies will enable us to design optical polymers that are free from the numerous diverse and inherent flaws that plague competitive polymer technologies employed by other companies and research groups. We engineer our polymers with the intent to have temporal, thermal, chemical and photochemical stability within our patented and patent pending molecular architectures.

Our non-linear all optical polymers have demonstrated resonantly enhanced third-order properties approximately 2,630 times larger than fused silica, which means that they are highly photo-optically active in the absence of an RF layer. In this way they differ from other optical polymers and are considered more advanced next-generation materials.

Our patented and patent pending molecular architectures are based on a well-understood chemical and quantum mechanical occurrence known as aromaticity. Aromaticity provides a high degree of molecular stability. Aromaticity is what will enable our core molecular structures to maintain stability under a broad range of polymerization conditions that otherwise appear to affect other current polymer molecular designs. Polymers, polymer-based devices, hybrid devices and the processes used to create them are often patentable, which can provide the developers of such technology with a significant competitive advantage. We consider our proprietary intellectual property to be unique.

Our Business Development

PSI-TEC Corporation (PSI-TEC) was founded in 1991 and incorporated under the laws of the State of Delaware on September 12, 1995. Dr. Frederick J. Goetz founded PSI-TEC in Upland, Pennsylvania where he established a laboratory with a small amount of private funding. PSI-TEC subsequently moved its operations to laboratory space provided by the U.S. Army on the Aberdeen Proving Grounds in cooperation with a division of the Department of Defense for the advancement of ultra wide-bandwidth satellite telecommunications. Thereafter, PSI-TEC commenced operations of its own organic synthesis and thin-films laboratory in Wilmington, Delaware.

In order to become a non-reporting publicly-traded corporation, in July 2004 PSI-TEC reorganized with Eastern Idaho Internet Services, Inc. (Eastern Idaho) whereby (i) Eastern Idaho changed its name to PSI-TEC Holdings, Inc. (PSI-TEC Holdings); (ii) PSI-TEC Holdings acquired all of the issued and outstanding shares of PSI-TEC stock; (iii) PSI-TEC became PSI-TEC Holdings wholly-owned operating subsidiary; and (iv) PSI-TEC Holdings then sole officer and director resigned, PSI-TEC's nominees were elected to PSI-TEC Holdings board of directors and new management was appointed. For accounting purposes, this acquisition transaction was accounted for as a reverse-acquisition, whereby PSI-TEC was deemed to have purchased PSI-TEC Holdings. As a result, the historical financial statements of PSI-TEC became the historical financial statements of PSI-TEC Holdings.

Immediately prior to the time of the reorganization transaction, Eastern Idaho was a non-reporting development stage company whose stock was traded on the OTC: Pink Sheets. It had no substantive business operations and it was seeking other business opportunities. Eastern Idaho was originally incorporated under the laws of the State of Nevada on June 24, 1997 to operate as an Internet services marketing firm. It was unsuccessful in this venture, and in June 1998 it ceased its operations and sold all of its operating assets.

On October 20, 2006, in order to consolidate the operations of PSI-TEC Holdings, Inc. and PSI-TEC Corp. (PSI-TEC Holdings, Inc.'s wholly owned subsidiary), PSI-TEC Holdings, Inc. and PSI-TEC Corp. merged; and PSI-TEC Holdings, Inc., a Nevada corporation, became the surviving entity and subsequently changed its name to Third-Order Nanotechnologies, Inc. No change of control or domicile occurred as a result of the merger.

On March 10, 2008, Third-order Nanotechnologies, Inc. changed its name to Lightwave Logic, Inc. to better suit its strategic business plan and to facilitate stockholder recognition of the Company and its business.

Corporate Information

Our principal executive office is located at 1831 Lefthand Circle, Suite C, Longmont, CO 80501, and our telephone number is (720) 340-4949. Our website address is www.lightwavelogic.com. No information found on our website is part of this prospectus. Also, this prospectus includes the names of various government agencies and the trade names of other companies. Unless specifically stated otherwise, the use or display by us of such other parties' names and trade names in this prospectus is not intended to and does not imply a relationship with, or endorsement or sponsorship of us by, any of these other parties.

The Offering

Common stock outstanding prior to the offering (1)	65,601,501 shares, including 4,207,600 shares previously issued to the selling securityholders pursuant to the private placements (and included in this offering).
Common Stock offered by the selling securityholders	Up to 6,076,900 shares, consisting of 1,869,300 shares previously issued to the selling securityholders, and 4,207,600 additional shares underlying warrants held by the selling securityholders.
Common stock to be outstanding after giving effect to the sale of 6,076,900 shares by the	69,809,101 shares

selling securityholders under the Offering

Use of proceeds	We will not receive any proceeds from the sale of the 4,207,600 shares of common stock previously sold to the selling securityholders in the private placements. However, we may receive up to $4,733,550 from the exercise by the selling securityholders of 4,207,600 warrants (i.e., 2,103,800 warrants exercisable at $1.00 per share and 2,103,800 warrants exercisable at $1.25 per share). Any proceeds that we receive from selling securityholders upon the exercise of warrants will be used for research and development and working capital purposes. See Use of Proceeds .
OTC Markets (OTCQB) symbol	LWLG
Risk factors	This investment involves a high degree of risk. See Risk Factors for a discussion of factors you should consider carefully before making an investment decision.

(1)

The number of shares of our common stock set forth above is based on 65,601,501 shares of common stock outstanding as of June 2, 2016, and excludes:

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options to purchase 6,759,500 shares of our common stock pursuant to our 2007 Employee Stock Plan, of which 6,268,250 have vested, at a weighted average exercise price of $0.82 per share; and

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warrants to purchase an aggregate of 12,263,867 shares of our common stock, of which 12,197,193 have vested, at a weighted average exercise price of $0.96 per share.

The Private Placements

On July 11, 2014 (the Closing Date) we completed a Regulation D Rule 506 private placement offering solely to accredited investors of units, with each unit consisting of 67,000 shares of our common stock and a warrant (each, a Warrant) to purchase 33,500 shares of common stock at $1.00 per share and 33,500 shares of common stock at $1.25 per share (each, a Unit), for $50,000 per Unit, or approximately $0.75 per share of common stock. We also simultaneously completed a Regulation S private placement offering of Units having the same terms as the Regulation D, and in total, the Company sold 60.8 Units for total proceeds to us in both offerings equal to $3,140,000 (together, the Offering).

Immediately prior to the completion of the Offering, the Company had 53,080,469 shares issued and outstanding, and after the issuance of 4,207,600 shares in the aggregate pursuant to the Offering, or 7.93% of the total issued and outstanding immediately prior to the commencement of the Offering, we had 57,221,069 shares issued and outstanding. We sold 4,207,600 Warrants in the Offering, which, for the avoidance of any doubt, were a part of the Units sold.

In connection with the Offering, each investor executed a subscription agreement which contains, among other things, registration rights whereby we were required to, within sixty (60) calendar days from the Closing Date, register the common stock and the shares of common stock underlying the Warrants by filing a registration statement with the Securities and Exchange Commission, which registration statement was filed on September 9, 2014 and declared effective on September 17, 2014.

The warrants shall expire on the fifth (5th) anniversary of the Closing Date. The Offering was made directly by us and no underwriter or placement agent was engaged by us in connection with the Offering. The Company intends to use 60% of the proceeds from the Offering for research and development and 40% for working capital purposes.

On August 25, 2014, we sold one (1) Unit (i.e., 67,000 shares of common stock and a warrant to purchase 33,500 shares of common stock at $1.00 per share and 33,500 shares of common stock at $1.25 per share) to an accredited investor in consideration for $50,000 on terms substantially similar to the Offering. In connection with this sale, we granted such investor piggy back registration rights, and we are therefore registering such investor's 134,000 shares of common stock, of which 67,000 shares underlie warrants which have not been exercised as of the date hereof, in this prospectus.

As of the date of this prospectus, the selling securityholders have sold 2,338,300 shares under the Existing Registration Statement, for which we have not received any proceeds. However, we may receive up to $4,733,550

from the exercise by the selling securityholders of 4,207,600 warrants (i.e., 2,103,800 warrants exercisable at $1.00 per share and 2,103,800 warrants exercisable at $1.25 per share), which remain outstanding as of the date of this prospectus.

Issuances of our common stock in this offering will not affect the rights or privileges of our existing stockholders, except that the economic and voting interests of each of our existing stockholders will be diluted as a result of any issuances of shares underlying the Warrants. Although the number of shares of common stock that our existing stockholders own will not decrease, the shares owned by our existing stockholders will represent a smaller percentage of our total outstanding shares after any such issuances upon the exercise of the Warrants by the selling securityholders.

Glossary of Select Technology Terms Used Herein

All-optical devices

All-optical devices convert data in the form of input light signals to a secondary light data stream. The future market of all-optical devices and switches is expected to include all-optical transistors.

All-optical transistors

All-optical transistors are devices currently under development that use an input light signal to switch a secondary light signal. All-optical transistors are expected to enable the fabrication of an entirely new generation of high-speed computers that operate on light instead of electricity. We believe that this will significantly improve computation speeds.

Aromaticity

Aromaticity causes an extremely high degree of molecular stability. It is a molecular arrangement wherein atoms combine into a ring or rings and share their electrons among each other. Aromatic compounds are extremely stable because the electronic charge distributes evenly over a great area preventing hostile moieties, such as oxygen and free radicals, from finding an opening to attack.

CLD-1

An electro-optic material based upon unstable polyene molecular architectures. Unlike our own molecular designs, CLD-1 is not a CSC model molecule and exhibits thermal degradation at low temperatures (~250 C) making it less suitable for commercial and military applications.

CSC (Cyclical Surface Conduction) theory

Most charge-transfer dyes (e.g. Disperse Red 1, CLD, FTC) are based upon a polyene architecture wherein the ground state and first excited state differ by the alteration of single and double bonds. CSC model molecules use nitrogenous heterocyclical structures.

Electro-optic devices

Electro-optic devices convert data from electric signals into optical signals for use in communications systems and in optical interconnects for high-speed data transfer.

Electro-optic material

Electro-optic material is the core active ingredient in high-speed fiber-optic telecommunication systems. Electro-optic materials are materials that are engineered at the molecular level. Molecular level engineering is commonly referred to as nanotechnology.

Electro-optic modulators

Electro-optic modulators are electro-optic devices that perform electric-to-optic conversions within the infrastructure of the Internet. Data centers may also benefit from this technology through devices that could significantly increase bandwidth and speed while decreasing costs.

Nanotechnology

Nanotechnology refers to the development of products and production processes at the molecular level, which is a scale smaller than 100 nanometers (a nanometer is one-billionth of a meter).

Nitrogenous heterocyclical structure

A multi-atom molecular ring or combination of rings that contain nitrogen.

Plastics/Polymers

Polymers, also known as plastics, are large carbon-based molecules that bond many small molecules together to form a long chain. Polymer materials can be engineered and optimized using nanotechnology to create a system in which unique surface, electrical, chemical and electro-optic characteristics can be controlled. Materials based on polymers are used in a multitude of industrial and consumer products, from automotive parts to home appliances and furniture, as well as scientific and medical equipment.

Polymerization

Polymerization is a molecular engineering process that provides the environmental and thermal stability necessary for functional electro-optical devices. Polymer materials can be engineered and optimized using nanotechnology to create a system in which unique surface, electrical, chemical and electro-optic characteristics can be controlled.

Thermal Gravimetric Analysis (TGA)

The basic principle in TGA is to measure the mass of a sample as a function of temperature. This, in principle, simple measurement is an important and powerful tool in solid-state chemistry and materials science. The method, for example, can be used to determine water of crystallization, follow degradation of materials, determine reaction kinetics, study oxidation and reduction, or to teach the principles of stoichiometry, formulae and analysis.

Zwitterionic-aromatic push-pull

Most charge-transfer dyes (e.g. Disperse Red 1, CLD, FTC) have an excited state (such as during photonic absorption) wherein a full charge is separated across the molecule. Such a molecule is said to be excited-state zwitterionic. Within such a molecular system the zwitterionic state is unstable and the molecule typically collapses rapidly into its lower dipole ground state. In our patented molecular designs, the excited state is further stabilized by the aromatization of the molecular core. In that aromaticity stabilizes this excited state, it is said to pull the molecule into this higher energy state; on the other hand, the unstable zwitterionic state is said to push the molecule out of the excited state.

RISK FACTORS

Before you make a decision to invest in our securities, you should consider carefully the risks described below, together with other information in this prospectus. If any of the following events actually occur, our business, operating results, prospects or financial condition could be materially and adversely affected. This could cause the trading price of our common stock to decline and you may lose all or part of your investment. The risks described below are not the only ones that we face. Additional risks not presently known to us or that we currently deem immaterial may also significantly impair our business operations and could result in a complete loss of your investment.

We have incurred substantial operating losses since our inception and will continue to incur substantial operating losses for the foreseeable future.

Since our inception, we have been engaged primarily in the research and development of our electro-optic polymer materials technologies and potential products. As a result of these activities, we incurred significant losses and experienced negative cash flow since our inception. We incurred a net loss of $4,845,432 for the year ended December 31, 2015 and $4,409,797 for the year ended December 31, 2014. We anticipate that we will continue to incur operating losses through at least the end of 2016.

We may not be able to generate significant revenue either through development contracts from the U.S. government or government subcontractors or through customer contracts for our potential products or technologies. We expect to continue to make significant operating and capital expenditures for research and development and to improve and expand production, sales, marketing and administrative systems and processes. As a result, we will need to generate significant additional revenue to achieve profitability. We cannot assure you that we will ever achieve profitability.

We are subject to the risks frequently experienced by early stage companies.

The likelihood of our success must be considered in light of the risks frequently encountered by early stage companies, especially those formed to develop and market new technologies. These risks include our potential inability to:

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Establish product sales and marketing capabilities;

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Establish and maintain markets for our potential products;

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Identify, attract, retain and motivate qualified personnel;

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Continue to develop and upgrade our technologies to keep pace with changes in technology and the growth of markets using polymer based materials;

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Develop expanded product production facilities and outside contractor relationships;

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Maintain our reputation and build trust with customers;

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Scale up from small pilot or prototype quantities to large quantities of product on a consistent basis;

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Contract for or develop the internal skills needed to master large volume production of our products; and

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Fund the capital expenditures required to develop volume production due to the limits of our available financial resources.

If we fail to effectively manage our growth, and effectively transition from our focus on research and development activities to commercially successful products, our business could suffer.

Failure to manage growth of operations could harm our business. To date, a large number of our activities and resources have been directed at the research and development of our technologies and development of potential related products. The transition from a focus on research and development to being a vendor of products requires effective planning and management. Additionally, growth arising from the expected synergies from future acquisitions will require effective planning and management. Future expansion will be expensive and will likely strain management and other resources.

In order to effectively manage growth, we must:

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Continue to develop an effective planning and management process to implement our business strategy;

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Hire, train and integrate new personnel in all areas of our business; and

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Expand our facilities and increase capital investments.

We cannot assure you that we will be able to accomplish these tasks effectively or otherwise effectively manage our growth.

We will require additional capital to continue to fund our operations and if we do not obtain additional capital, we may be required to substantially limit our operations.

Our business does not presently generate the cash needed to finance our current and anticipated operations. Based on our current operating plan and budgeted cash requirements, we believe that we have sufficient funds to finance our operations through January 2017; however, we will need to obtain additional future financing after that time to finance our operations until such time that we can conduct profitable revenue-generating activities. We expect that we will need to seek additional funding through public or private financings, including equity financings, and through other arrangements, including collaborative arrangements. Poor financial results, unanticipated expenses or unanticipated opportunities could require additional financing sooner than we expect. We have no plans or arrangements with respect to the possible acquisition of additional financing, and such financing may be unavailable when we need it or may not be available on acceptable terms.

Our forecast of the period of time through which our financial resources will be adequate to support our operations is a forward-looking statement and involves risks and uncertainties, and actual results could vary as a result of a number of factors, including the factors discussed elsewhere in this annual report. We have based this estimate on assumptions that may prove to be wrong, and we could use our available capital resources sooner than we currently expect.

Additional financing may not be available to us, due to, among other things, our Company not having a sufficient credit history, income stream, profit level, asset base eligible to be collateralized, or market for its securities. If we raise additional funds by issuing equity or convertible debt securities, the percentage ownership of our existing shareholders may be reduced, and these securities may have rights superior to those of our common stock. If adequate funds are not available to satisfy our long-term capital requirements, or if planned revenues are not generated, we may be required to substantially limit our operations.

We are entering new markets, and if we fail to accurately predict growth in these new markets, we may suffer substantial losses.

We are devoting significant resources to engineer next-generation organic nonlinear optical materials for future applications to be utilized by electro-optic device manufacturers, such as telecommunications component and systems manufacturers, networking and switching suppliers, semiconductor companies, aerospace companies and government agencies as well as the our proprietary photonic devices. We expect to continue to develop products for these markets and to seek to identify new markets. These markets change rapidly and we cannot assure you that they will grow or that we will be able to accurately forecast market demand, or lack thereof, in time to respond appropriately. Our investment of resources to develop products for these markets may either be insufficient to meet actual demand or result in expenses that are excessive in light of actual sales volumes. Failure to predict growth and demand accurately in new markets may cause us to suffer substantial losses. In addition, as we enter new markets, there is a significant

risk that:

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The market may not accept the price and/or performance of our products;

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There may be issued patents we are not aware of that could block our entry into the market or could result in excessive litigation; and

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The time required for us to achieve market acceptance of our products may exceed our capital resources that would require additional investment.

Our plan to develop relationships with strategic partners may not be successful.

Part of our business strategy is to maintain and develop strategic relationships with government agencies, private firms, and academic institutions to conduct research and development of technologies and products. For these efforts to be successful, we must identify partners whose competencies complement ours. We must also successfully enter into agreements with them on terms attractive to us, and integrate and coordinate their resources and capabilities with our own. We may be unsuccessful in entering into agreements with acceptable partners or negotiating favorable terms in these agreements. Also, we may be unsuccessful in integrating the resources or capabilities of these partners. In addition, our strategic partners may prove difficult to work with or less skilled than we originally expected. If we are unsuccessful in our collaborative efforts, our ability to develop and market products could be severely limited.

The failure to establish and maintain collaborative relationships may have a materially adverse affect on our business.

We plan to sell many of our products directly to commercial customers or through potential industry partners. For example, we expect to sell our electro-optic polymer products to electro-optic device manufacturers, such as telecommunications component and systems manufacturers, networking and switching suppliers, semiconductor companies, aerospace companies and government agencies. Our ability to generate revenues depends significantly on the extent to which potential customers and other potential industry partners develop, promote and sell systems that incorporate our products, which, of course, we cannot control. Any failure by potential customers and other potential industry partners to successfully develop and market systems that incorporate our products could adversely affect our sales. The extent to which potential customers and other industry partners develop, promote and sell systems incorporating our products is based on a number of factors that are largely beyond our ability to control.

We may participate in joint ventures that expose us to operational and financial risk.

We may participate in one or more joint ventures for the purpose of assisting us in carrying out our business expansion, especially with respect to new product and/or market development. We may experience with our joint venture partner(s) issues relating to disparate communication, culture, strategy, and resources. Further, our joint venture partner(s) may have economic or business interests or goals that are inconsistent with ours, exercise their rights in a way that prohibits us from acting in a manner which we would like or they may be unable or unwilling to fulfill their obligations under the joint venture or other agreements. We cannot assure you that the actions or decisions of our joint venture partners will not affect our operations in a way that hinders our corporate objectives or reduces any anticipated cost savings or revenue enhancement resulting from these ventures.

If we fail to develop and introduce new or enhanced products on a timely basis, our ability to attract and retain customers could be impaired and our competitive position could be harmed.

We plan to operate in a dynamic environment characterized by rapidly changing technologies and industry standards and technological obsolescence. To compete successfully, we must design, develop, market and sell products that provide increasingly higher levels of performance and reliability and meet the cost expectations of our customers. The introduction of new products by our competitors, the market acceptance of products based on new or alternative technologies, or the emergence of new industry standards could render our anticipated products obsolete. Our failure to anticipate or timely develop products or technologies in response to technological shifts could adversely affect our operations. In particular, we may experience difficulties with product design, manufacturing, marketing or certification that could delay or prevent our development, introduction or marketing of products. If we fail to introduce products that meet the needs of our customers or penetrate new markets in a timely fashion our Company will be adversely affected.

Our future growth will suffer if we do not achieve sufficient market acceptance of our organic nonlinear optical material products or our proprietary photonic devices.

We are developing our organic nonlinear optical material products to be utilized by electro-optic device manufacturers, such as telecommunications component and systems manufacturers, networking and switching suppliers, semiconductor companies, aerospace companies and government agencies as well as our proprietary photonic devices. All of our potential products are still in the development stage, and we do not know when a market for these products will develop, if at all. Our success depends, in part, upon our ability to gain market acceptance of our products. To be accepted, our products must meet the technical and performance requirements of our potential customers. OEMs, suppliers or government agencies may not accept polymer-based products. In addition, even if we achieve some degree of market acceptance for our potential products in one industry, we may not achieve market acceptance in other industries for which we are developing products.

Achieving market acceptance for our products will require marketing efforts and the expenditure of financial and other resources to create product awareness and demand by customers. We may be unable to offer products that compete effectively due to our limited resources and operating history. Also, certain large corporations may be predisposed against doing business with a company of our limited size and operating history. Failure to achieve broad acceptance of our products by customers and to compete effectively would harm our operating results.

Our potential customers require our products to undergo a lengthy and expensive qualification process, which does not assure product sales.

Prior to purchasing our products, our potential customers require that both our products undergo extensive qualification processes. These qualification processes may continue for several months or more. However, qualification of a product by a customer does not assure any sales of the product to that customer. Even after successful qualification and sales of a product to a customer, a subsequent revision to the product, changes in our customer s manufacturing process or our selection of a new supplier may require a new qualification process, which may result in additional delays. Also, once one of our products is qualified, it could take several additional months or more before a customer commences volume production of components or devices that incorporate our products. Despite these uncertainties, we are devoting substantial resources, including design, engineering, sales, marketing and management efforts, to qualifying our products with customers in anticipation of sales. If we are unsuccessful or delayed in qualifying any of our products with a customer, sales of our products to a customer may be precluded or delayed, which may impede our growth and cause our business to suffer.

Obtaining a sales contract with a potential customer does not guarantee that a potential customer will not decide to cancel or change its product plans, which could cause us to generate no revenue from a product and adversely affect our results of operations.

Even after we secure a sales contract with a potential customer, we may experience delays in generating revenue from our products as a result of a lengthy development cycle that may be required. Potential customers will likely take a considerable amount of time to evaluate our products; it could take 12 to 24 months from early engagement by our sales team to actual product sales. The delays inherent in these lengthy sales cycles increase the risk that a customer will decide to cancel, curtail, reduce or delay its product plans, causing us to lose anticipated sales. In addition, any delay or cancellation of a customer s plans could materially and adversely affect our financial results, as we may have incurred significant expense and generated no revenue. Finally, our customers failure to successfully market and sell their products could reduce demand for our products and materially and adversely affect our business, financial condition and results of operations. If we were unable to generate revenue after incurring substantial expenses to develop any of our products, our business would suffer.

Many of our products will have long sales cycles, which may cause us to expend resources without an acceptable financial return and which makes it difficult to plan our expenses and forecast our revenue.

Many of our products will have long sales cycles that involve numerous steps, including initial customer contacts, specification writing, engineering design, prototype fabrication, pilot testing, regulatory approvals (if needed), sales and marketing and commercial manufacture. During this time, we may expend substantial financial resources and management time and effort without any assurance that product sales will result. The anticipated long sales cycle for

some of our products makes it difficult to predict the quarter in which sales may occur. Delays in sales may cause us to expend resources without an acceptable financial return and make it difficult to plan expenses and forecast revenues.

Successful commercialization of our current and future products will require us to maintain a high level of technical expertise.

Technology in our target markets is undergoing rapid change. To succeed in our target markets, we will have to establish and maintain a leadership position in the technology supporting those markets. Accordingly, our success will depend on our ability to:

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Accurately predict the needs of our target customers and develop, in a timely manner, the technology required to support those needs;

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Provide products that are not only technologically sophisticated but are also available at a price acceptable to customers and competitive with comparable products;

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Establish and effectively defend our intellectual property; and

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Enter into relationships with other companies that have developed complementary technology into which our products may be integrated.

We cannot assure you that we will be able to achieve any of these objectives.

Two of our significant target markets are the telecommunications and networking markets, which are subject to slow growth and overcapacity.

Two of our significant target markets are the telecommunications and networking markets, and developments that adversely affect the telecommunications or networking markets, including delays in traffic growth and changes in U.S. government regulation, could slow down, or even halt our efforts to enter into these markets. Reduced spending and technology investment by telecommunications companies may make it more difficult for our products to gain market acceptance. Such companies may be less willing to purchase new technology such as ours or invest in new technology development when they have reduced capital expenditure budgets.

Our inability to successfully acquire and integrate other businesses, assets, products or technologies could harm our business and cause us to fail at achieving our anticipated growth.

It is our intent to continue to grow our business through strategic acquisitions and investments and we are actively evaluating acquisitions and strategic investments in businesses, products or technologies that we believe could complement or expand our product offering, create and/or expand a client base, enhance our technical capabilities or otherwise offer growth or cost-saving opportunities. From time to time, we may enter into letters of intent with companies with which we are negotiating potential acquisitions or investments or as to which we are conducting due diligence. Although we are currently not a party to any binding definitive agreement with respect to potential investments in, or acquisitions of, complementary businesses, products or technologies, we may enter into these types of arrangements in the future, which could materially decrease the amount of our available cash or require us to seek additional equity or debt financing. We have limited experience in successfully acquiring and integrating businesses, products and technologies. We may not be successful in negotiating the terms of any potential acquisition, conducting thorough due diligence, financing the acquisition or effectively integrating the acquired business, product or technology into our existing business and operations. Our due diligence may fail to identify all of the problems, liabilities or other shortcomings or challenges of an acquired business, product or technology, including issues related to intellectual property, product quality or product architecture, regulatory compliance practices, revenue recognition or other accounting practices, or employee or customer issues.

Additionally, in connection with any acquisitions we complete, we may not achieve the synergies or other benefits we expected to achieve, and we may incur write-downs, impairment charges or unforeseen liabilities that could negatively affect our operating results or financial position or could otherwise harm our business. If we finance acquisitions using existing cash, the reduction of our available cash could cause us to face liquidity issues or cause other unanticipated problems in the future. If we finance acquisitions by issuing convertible debt or equity securities, the ownership interest of our existing stockholders may be diluted, which could adversely affect the market price of our stock. Further, contemplating or completing an acquisition and integrating an acquired business, product or technology could divert management and employee time and resources from other matters, which could harm our business, financial condition and operating results.

We may not be able to access the full amounts available under the Purchase Agreement with Lincoln Park Capital, which could prevent us from accessing the capital we need to continue our operations that could have an adverse affect on our business.

Under the purchase agreement (the Purchase Agreement) we entered into with Lincoln Park Capital Fund, LLC (Lincoln Park), we may direct Lincoln Park to purchase up to $20,000,000 worth of shares of our common stock over a 36-month period. On any trading day selected by us, we may sell shares of common stock to Lincoln Park in amounts up to 100,000 shares per regular sale (Regular Purchases), which may be increased to up to 200,000 shares depending on certain conditions as set forth in the Purchase Agreement, up to the aggregate commitment of $20,000,000. If the market price of our common stock is not below $1.00 per share on the purchase date, then the Regular Purchase amount may be increased to 150,000 shares. If the market price is not below $1.50 per share on the purchase date, then the Regular Purchase amount may be increased to 200,000 shares. Although there are no upper limits on the per share price Lincoln Park may pay to purchase our common stock, the Company may not sell more than $500,000 in shares of common stock to Lincoln Park per Regular Purchase.

In addition to Regular Purchases, we may in our sole discretion direct Lincoln Park on each purchase date to make accelerated purchases on the following business day up to the lesser of (i) two (2) times the number of shares purchased pursuant to such Regular Purchase or (ii) 30% of the trading volume on the accelerated purchase date at a purchase price equal to the lesser of (i) the closing sale price on the accelerated purchase date and (ii) 95% of the accelerated purchase date s volume weighted average price.

The purchase price of the shares related to the Purchase Agreement will be based on the prevailing market prices of the Company s shares of common stock, which shall be equal to the lesser of the lowest sale price of the common shares during the purchase date and the average of the three (3) lowest closing sale prices of the common shares during the twelve (12) business days prior to the purchase date without any fixed discount.

Depending on the prevailing market price of our common stock, we may not be able to sell shares to Lincoln Park for the maximum $20,000,000 over the term of the Purchase Agreement.

Assuming a purchase price of $1.00 per share and the issuance to Lincoln Park of 4,650,000 additional shares under the Purchase Agreement, which would be comprised of 4,000,000 shares purchased at $1.00 per share and 130,000 shares issued as additional pro rata commitment shares for no additional consideration, the proceeds to us would only be $4,000,000. In the event we elect to issue more than 4,650,000 additional shares, we would be required to file a new registration statement and have it declared effective by the SEC.

The sale of shares of our common stock to Lincoln Park under the Purchase Agreement may cause substantial dilution to our existing stockholders and could cause the price of our common stock to decline.

Under the Purchase Agreement, we may sell to Lincoln Park, from time to time and under certain circumstances, up to $20,000,000 of our common stock over approximately 36 months subsequent to January 2016. Generally, with respect to the Purchase Agreement, we have the right, but no obligation, to direct Lincoln Park to periodically purchase up to $20,000,000 of our common stock in specific amounts under certain conditions, which periodic purchase amounts can be increased under specified circumstances.

We also agreed to issue to Lincoln Park up to an aggregate of 1,000,000 shares of common stock as a fee for Lincoln Park s commitment to purchase our shares under the Purchase Agreement. Of these commitment shares, we issued 350,000 shares upon entering into the Purchase Agreement. The remaining 650,000 commitment shares are issuable to Lincoln Park on a pro rata basis as additional purchases are made under the Purchase Agreement.

Depending upon market liquidity at the time, sales of shares of our common stock to Lincoln Park may cause the trading price of our common stock to decline. Lincoln Park may ultimately purchase all, some or none of the $20,000,000 of common stock under the Purchase Agreement, and after it has acquired shares, Lincoln Park may sell all, some or none of those shares. Therefore, sales to Lincoln Park by us could result in substantial dilution to the interests of other holders of our common stock. The sale of a substantial number of shares of our common stock to Lincoln Park, or the anticipation of such sales, could make it more difficult for us to sell equity or equity-related securities in the future at a time and at a price that we might otherwise wish to effect sales. However, we have the

right to control the timing and amount of any sales of our shares to Lincoln Park, and the Purchase Agreement may be terminated by us at any time at our discretion without any cost to us.

The exercise of options and warrants and other issuances of shares of common stock or securities convertible into common stock will dilute your interest.

As of December 31, 2015, we have outstanding options and warrants to purchase an aggregate of 18,006,488 shares of our common stock at exercise prices ranging from $0.63 - $1.69 per share with a weighted average exercise price of $0.92 per share. The exercise of options and warrants at prices below the market price of our common stock could adversely affect the price of shares of our common stock. Additional dilution may result from the issuance of shares of our capital stock in connection with any collaboration (although none are contemplated at this time) or in connection with other financing efforts, including pursuant to the Purchase Agreement with Lincoln Park.

Any issuance of our common stock that is not made solely to then-existing stockholders proportionate to their interests, such as in the case of a stock dividend or stock split, will result in dilution to each stockholder by reducing his, her or its percentage ownership of the total outstanding shares. Moreover, if we issue options or warrants to purchase our common stock in the future and those options or warrants are exercised or we issue restricted stock, stockholders may experience further dilution. Holders of shares of our common stock have no preemptive rights that entitle them to purchase their pro rata share of any offering of shares of any class or series.

We may incur debt in the future that might be secured with our intellectual property as collateral, which could subject our Company to the risk of loss of all of our intellectual property.

If we incur debt in the future, we may be required to secure the debt with our intellectual property, including all of our patents and patents pending. In the event we default on the debt, we could incur the loss of all of our intellectual property, which would materially and adversely affect our Company and cause you to lose your entire investment in our Company.

Our quarter-to-quarter performance may vary substantially, and this variance, as well as general market conditions, may cause our stock price to fluctuate greatly and even potentially expose us to litigation.

We have generated no significant sales to date and we cannot accurately estimate future quarterly revenue and operating expenses based on historical performance. Our quarterly operating results may vary significantly based on many factors, including:

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Fluctuating demand for our potential products and technologies;

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Announcements or implementation by our competitors of technological innovations or new products;

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Amount and timing of our costs related to our marketing efforts or other initiatives;

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The status of particular development programs and the timing of performance under specific development agreements;

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Timing and amounts relating to the expansion of our operations;

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Product shortages requiring suppliers to allocate minimum quantities;

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Announcements or implementation by our competitors of technological innovations or new products;

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The status of particular development programs and the timing of performance under specific development agreements;

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Our ability to enter into, renegotiate or renew key agreements;

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Timing and amounts relating to the expansion of our operations;

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Costs related to possible future acquisitions of technologies or businesses; or

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Economic conditions specific to our industry, as well as general economic conditions.

Our current and future expense estimates are based, in large part, on estimates of future revenue, which is difficult to predict. We expect to continue to make significant operating and capital expenditures in the area of research and development and to invest in and expand production, sales, marketing and administrative systems and processes. We may be unable to, or may elect not to, adjust spending quickly enough to offset any unexpected revenue shortfall. If our increased expenses were not accompanied by increased revenue in the same quarter, our quarterly operating results would be harmed.

Our failure to compete successfully could harm our business.

The markets that we are targeting for our organic nonlinear optical material technology are intensely competitive. Most of our present and potential competitors have or may have substantially greater research and product development capabilities, financial, scientific, marketing, manufacturing and human resources, name recognition and experience than we have. As a result, these competitors may:

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Succeed in developing products that are equal to or superior to our potential products or that will achieve greater market acceptance than our potential products;

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Devote greater resources to developing, marketing or selling their products;

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Respond more quickly to new or emerging technologies or scientific advances and changes in customer requirements, which could render our technologies or potential products obsolete;

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Introduce products that make the continued development of our potential products uneconomical;

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Obtain patents that block or otherwise inhibit our ability to develop and commercialize our potential products;

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Withstand price competition more successfully than we can;

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Establish cooperative relationships among themselves or with third parties that enhance their ability to address the needs of our prospective customers.

The failure to compete successfully against these existing or future competitors could harm our business.

We may be unable to obtain effective intellectual property protection for our potential products and technology.

Our intellectual property, or any intellectual property that we have or may acquire, license or develop in the future, may not provide meaningful competitive advantages. Our patents and patent applications, including those we license, may be challenged by competitors, and the rights granted under such patents or patent applications may not provide meaningful proprietary protection. For example, numerous patents held by third parties relate to polymer materials and electro-optic devices. These patents could be used as a basis to challenge the validity or limit the scope of our patents or patent applications. A successful challenge to the validity or limitation of the scope of our patents or patent applications could limit our ability to commercialize our polymer materials technology and, consequently, reduce our revenues.

Moreover, competitors may infringe our patents or those that we license, or successfully avoid these patents through design innovation. To combat infringement or unauthorized use, we may need to resort to litigation, which can be expensive and time-consuming and may not succeed in protecting our proprietary rights. In addition, in an infringement proceeding a court may decide that our patents or other intellectual property rights are not valid or are unenforceable, or may refuse to stop the other party from using the intellectual property at issue on the ground that it is non-infringing. Policing unauthorized use of our intellectual property is difficult and expensive, and we may not be able to, or have the resources to, prevent misappropriation of our proprietary rights, particularly in countries where the laws may not protect these rights as fully as the laws of the United States.

We also rely on the law of trade secrets to protect unpatented technology and know-how. We try to protect this technology and know-how by limiting access to those employees, contractors and strategic partners with a need to know this information and by entering into confidentiality agreements with these parties. Any of these parties could breach the agreements and disclose our trade secrets or confidential information to our competitors, or these competitors might learn of the information in other ways. Disclosure of any trade secret not protected by a patent could materially harm our business.

We may be subject to patent infringement claims, which could result in substantial costs and liability and prevent us from commercializing our potential products.

Third parties may claim that our potential products or related technologies infringe their patents. Any patent infringement claims brought against us may cause us to incur significant expenses, divert the attention of our management and key personnel from other business concerns and, if successfully asserted against us, require us to pay substantial damages. In addition, as a result of a patent infringement suit, we may be forced to stop or delay developing, manufacturing or selling potential products that are claimed to infringe a patent covering a third party's intellectual property unless that party grants us rights to use its intellectual property. We may be unable to obtain these

rights on terms acceptable to us, if at all. Even if we are able to obtain rights to a third party's patented intellectual property, these rights may be non-exclusive, and therefore our competitors may obtain access to the same intellectual property. Ultimately, we may be unable to commercialize our potential products or may have to cease some of our business operations as a result of patent infringement claims, which could severely harm our business.

If our potential products infringe the intellectual property rights of others, we may be required to indemnify customers for any damages they suffer. Third parties may assert infringement claims against our current or potential customers. These claims may require us to initiate or defend protracted and costly litigation on behalf of customers, regardless of the merits of these claims. If any of these claims succeed, we may be forced to pay damages on behalf of these customers or may be required to obtain licenses for the products they use. If we cannot obtain all necessary licenses on commercially reasonable terms, we may be unable to continue selling such products.

Our technology may be subject to government rights and retained research institution rights.

We may have obligations to government agencies or universities in connection with the technology that we have developed, including the right to require that a compulsory license be granted to one or more third parties selected by certain government agencies. In addition, academic research partners often retain certain rights, including the right to use the technology for noncommercial academic and research use, to publish general scientific findings from research related to the technology, and to make customary scientific and scholarly disclosures of information relating to the technology. It is difficult to monitor whether our partners will limit their use of the technology to these uses, and we could incur substantial expenses to enforce our rights to our licensed technology in the event of misuse.

The loss of certain of our key personnel, or any inability to attract and retain additional personnel, could impair our ability to attain our business objectives.

Our future success depends to a significant extent on the continued service of our key management personnel, particularly Thomas E. Zelibor, our Chief Executive Officer and James S. Marcelli our President and Chief Operating Officer. Accordingly, the loss of the services of either of these persons would adversely affect our business and our ability to timely commercialize our products, and impede the attainment of our business objectives.

Our future success will also depend on our ability to attract, retain and motivate highly skilled personnel to assist us with product development and commercialization. Competition for highly educated qualified personnel in the polymer industry is intense. If we fail to hire and retain a sufficient number of qualified management, engineering, sales and technical personnel, we will not be able to attain our business objectives.

If we fail to develop and maintain the quality of our manufacturing processes, our operating results would be harmed.

The manufacture of our potential products is a multi-stage process that requires the use of high-quality materials and advanced manufacturing technologies. Also, polymer-related device development and manufacturing must occur in a highly controlled, clean environment to minimize particles and other yield and quality-limiting contaminants. In spite of stringent quality controls, weaknesses in process control or minute impurities in materials may cause a substantial percentage of a product in a lot to be defective. If we are not able to develop and continue to improve on our manufacturing processes or to maintain stringent quality controls, or if contamination problems arise, our operating results would be harmed.

The complexity of our anticipated products may lead to errors, defects and bugs, which could result in the necessity to redesign products and could negatively, impact our reputation with customers.

Products as complex as those we intend to market might contain errors, defects and bugs when first introduced or as new versions are released. Delivery of products with production defects or reliability, quality or compatibility problems could significantly delay or hinder market acceptance of our products or result in a costly recall and could damage our reputation and adversely affect our ability to sell our products. If our products experience defects, we may need to undertake a redesign of the product, a process that may result in significant additional expenses.

We may also be required to make significant expenditures of capital and resources to resolve such problems. There is no assurance that problems will not be found in new products after commencement of commercial production, despite testing by our suppliers, our customers, and us.

If we decide to make commercial quantities of products at our facilities, we will be required to make significant capital expenditures to increase capacity.

We lack the internal ability to manufacture products at a level beyond the stage of early commercial introduction. To the extent we do not have an outside vendor to manufacture our products, we will have to increase our internal production capacity and we will be required to expand our existing facilities or to lease new facilities or to acquire entities with additional production capacities. These activities would require us to make significant capital investments and may require us to seek additional equity or debt financing. We cannot assure you that such financing would be available to us when needed on acceptable terms, or at all. Further, we cannot assure you that any increased demand for our potential products would continue for a sufficient period of time to recoup our capital investments associated with increasing our internal production capacity.

In addition, we do not have experience manufacturing our potential products in large quantities. In the event of significant demand for our potential products, large-scale production might prove more difficult or costly than we anticipate and lead to quality control issues and production delays.

We may not be able to manufacture products at competitive prices.

To date, we have produced limited quantities of products for research, development, demonstration and prototype purposes. The cost per unit for these products currently exceeds the price at which we could expect to profitably sell them. If we cannot substantially lower our cost of production as we move into sales of products in commercial quantities, our financial results will be harmed.

We conduct significantly all of our research and development activities at a limited number of facilities, and circumstances beyond our control may result in considerable interruptions.

We conduct significantly all of our research and development activities at a limited number of facilities. A disaster such as a fire, flood or severe storm at or near one of our facilities could prevent us from further developing our technologies or manufacturing our potential products, which would harm our business.

We are subject to regulatory compliance related to our operations.

We are subject to various U.S. governmental regulations related to occupational safety and health, labor and business practices. Failure to comply with current or future regulations could result in the imposition of substantial fines, suspension of production, alterations of our production processes, cessation of operations, or other actions, which could harm our business.

We may be unable to export our potential products or technology to other countries, convey information about our technology to citizens of other countries or sell certain products commercially, if the products or technology are subject to United States export or other regulations.

We are developing certain polymer-based products that we believe the United States government and other governments may be interested in using for military and information gathering or antiterrorism activities. United States government export regulations may restrict us from selling or exporting these potential products into other countries, exporting our technology to those countries, conveying information about our technology to citizens of other countries or selling these potential products to commercial customers. We may be unable to obtain export licenses for products or technology if necessary. We currently cannot assess whether national security concerns would affect our potential products and, if so, what procedures and policies we would have to adopt to comply with applicable existing or future regulations.

We may incur liability arising from the use of hazardous materials.

Our business and our facilities are subject to a number of federal, state and local laws and regulations relating to the generation, handling, treatment, storage and disposal of certain toxic or hazardous materials and waste products that we use or generate in our operations. Many of these environmental laws and regulations subject current or previous owners or occupiers of land to liability for the costs of investigation, removal or remediation of hazardous materials.

In addition, these laws and regulations typically impose liability regardless of whether the owner or occupier knew of, or was responsible for, the presence of any hazardous materials and regardless of whether the actions that led to the presence were taken in compliance with the law. In our business, we use hazardous materials that are stored on site. We use various chemicals in our manufacturing process that may be toxic and covered by various environmental controls. An unaffiliated waste hauler transports the waste created by use of these materials off-site. Many environmental laws and regulations require generators of waste to take remedial actions at an off-site disposal location even if the disposal was conducted lawfully. The requirements of these laws and regulations are complex, change frequently and could become more stringent in the future. Failure to comply with current or future environmental laws and regulations could result in the imposition of substantial fines, suspension of production, alteration of our production processes, cessation of operations or other actions, which could severely harm our business.

A material weakness in internal controls may remain undetected for a longer period because of our Company's exemption from the auditor attestation requirements under Section 404(b) of Sarbanes-Oxley.

Our annual report does not include an attestation report of the Company s independent registered public accounting firm regarding internal control over financial reporting. Management s report was not subject to attestation by the Company s registered public accounting firm pursuant to rules of the Securities and Exchange Commission that permit the Company to provide only management s attestation in this annual report. As a result, a material weakness in our internal controls may remain undetected for a longer period.

Shares Eligible for Future Sale May Adversely Affect the Market.

From time to time, certain of the Company s shareholders may be eligible to sell all or some of their shares of common stock by means of ordinary brokerage transactions in the open market pursuant to Rule 144, promulgated under the Securities Act of 1933, as amended (the Securities Act), subject to certain limitations. In general, a non-affiliate stockholder who has satisfied a six-month holding period may, under certain circumstances, sell its shares, without limitation. Any substantial sale of the Company s common stock pursuant to Rule 144 or pursuant to any resale prospectus may have a material adverse effect on the market price of our common stock.

There Is A Limited Market For Our Common Stock, Which May Make It More Difficult For You To Sell Your Stock.

Our Company s common stock is quoted on the OTC Market (OTCQB) under the symbol LWLG. The trading market for our common stock is limited, accordingly, there can be no assurance as to the liquidity of any markets that may develop for our common stock, your ability to sell our common stock, or the prices at which you may be able to sell our common stock.

We are subject to the penny stock rules and brokers cannot generally solicit the purchase of our common stock, which adversely affects its liquidity and market price.

The SEC has adopted regulations that generally define penny stock to be an equity security that has a market price of less than $5.00 per share, subject to specific exemptions. The market price of our common stock on the over-the-counter market has been substantially less than $5.00 per share and therefore we are currently considered a penny stock according to SEC rules. This designation requires any broker-dealer selling these securities to disclose certain information concerning the transaction, obtain a written agreement from the purchaser and determine that the purchaser is reasonably suitable to purchase the securities. These rules limit the ability of broker-dealers to solicit purchases of our common stock and therefore reduce the liquidity of the public market for our shares.

Our Company s Stock Price May Be Volatile.

The market price of our Company s common stock is likely to be highly volatile and could fluctuate widely in price in response to various factors, many of which are beyond our control, including:

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Technological innovations or new products and services by our Company or our competitors;

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Additions or departures of key personnel;

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Sales of our Company s common stock;

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Our Company s ability to integrate operations, technology, products and services;

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Our Company s ability to execute our business plan;

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Operating results below expectations;

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Loss of any strategic relationship;

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Industry developments

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Economic and other external factors; and

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Period-to-period fluctuations in our Company s financial results.

Because we have a limited operating history, you may consider any one of these factors to be material. Our stock price may fluctuate widely as a result of any of the above listed factors.

In addition, the securities markets have from time to time experienced significant price and volume fluctuations that are unrelated to the operating performance of particular companies. These market fluctuations may also materially and

adversely affect the market price of our Company s common stock.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus contains forward-looking statements that involve substantial risks and uncertainties. The forward-looking statements are contained principally in the sections entitled Prospectus Summary , Risk Factors , Management s Discussion and Analysis of Financial Condition and Results of Operations and Business but are also contained elsewhere in this prospectus. In some cases, you can identify forward-looking statements by the words may , might , will , could , would , should , expect , intend , plan , objective , anticipate , believe , estimat potential , continue and ongoing, or the negative of these terms, or other comparable terminology intended to identify statements about the future. These statements involve known and unknown risks, uncertainties and other factors that may cause our actual results, levels of activity, performance or achievements to be materially different from the information expressed or implied by these forward-looking statements. Although we believe that we have a reasonable basis for each forward-looking statement contained in this prospectus, we caution you that these statements are based on a combination of facts and factors currently known by us and our expectations of the future, about which we cannot be certain. Forward-looking statements include, but are not limited to, statements about:

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lack of available funding;

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general economic and business conditions;

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competition from third parties;

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intellectual property rights of third parties;

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regulatory constraints;

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changes in technology and methods of marketing;

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Delays in completing various engineering and manufacturing programs;

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changes in customer order patterns;

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changes in product mix;

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success in technological advances and delivering technological innovations;

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shortages in components;

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production delays due to performance quality issues with outsourced components;

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other risks to which our Company is subject; and

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other factors beyond the Company's control.

In addition, you should refer to the Risk Factors section of this prospectus for a discussion of other important factors that may cause our actual results to differ materially from those expressed or implied by our forward-looking statements. As a result of these factors, we cannot assure you that the forward-looking statements in this prospectus will prove to be accurate or that we will achieve the plans, intentions or expectations expressed or implied in our forward-looking statements. Furthermore, if our forward-looking statements prove to be inaccurate, the inaccuracy may be material. In light of the significant uncertainties in these forward-looking statements, you should not regard these statements as a representation or warranty by us or any other person that we will achieve our objectives and plans in any specified time frame, or at all. Any forward-looking statements we make in this prospectus speak only as of its date, and we undertake no obligation to publicly update any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by law.

You should read this prospectus and the documents that we reference in this prospectus and have filed as exhibits to the registration statement, of which this prospectus is a part, completely and with the understanding that our actual future results may be materially different from what we expect. We qualify all of our forward-looking statements by these cautionary statements.

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USE OF PROCEEDS

This prospectus relates to shares of our common stock that may be offered and sold from time to time by the selling securityholders. We have not received any proceeds from the sale of the 2,338,300 shares of common stock previously sold by the selling securityholders under the Existing Registration Statement. However, we may receive up to $4,733,550 from the exercise by the selling securityholders of 4,207,600 warrants (i.e., 2,103,800 warrants exercisable at $1.00 per share and 2,103,800 warrants exercisable at $1.25 per share).

We intend to use approximately 60% of any proceeds received towards our research and development efforts which may include, without limitation, (a) retaining additional management, sales, marketing, technical and other staff to our workforce, (b) expanding our research and development facilities, including the purchase of additional laboratory and production equipment, (c) marketing our future products as they are introduced into the marketplace, (d) developing and maintaining collaborative relationships with strategic partners, (e) developing and improving our manufacturing processes and quality controls, and approximately 40% of any proceeds received may be used for increasing our general and administrative activities related to our operations as a reporting public company and related corporate compliance requirements.

CAPITALIZATION

The following table sets forth our cash and cash equivalents and our capitalization as of March 31, 2016:

	March 31, 2016 (Unaudited)
Cash and cash equivalents	$ 3,021,734
Stockholders equity:	
Preferred stock, $0.001 par value, 1,000,000 shares authorized, no shares issued or outstanding	
Common stock, $0.001 par value, 100,000,000 shares authorized, 65,237,879 issued and outstanding	65,598
Additional paid-in-capital	46,940,627
Accumulated deficit	(42,896,631)
Total stockholders equity	4,109,594
Total capitalization	$ 4,238,815

The number of shares of common stock outstanding in the table above excludes, as of March 31, 2016 (a) 6,439,500 shares of our common stock issuable upon the exercise of outstanding options and (b) 12,263,867 shares of our common stock issuable upon the exercise of outstanding warrants (including the Warrants), with a weighted average exercise price of $0.96 per share.

MARKET FOR COMMON EQUITY AND RELATED SHAREHOLDER MATTERS

Market Information

Our common stock is quoted on the OTCQB under the symbol LWLG . The following table set forth below lists the range of high and low bids for our common stock for our two most recent fiscal years. The prices in the table reflect inter-dealer prices, without retail markup, markdown or commission and may not represent actual transactions or a liquid trading market.

		High	Low
2014	1st Quarter	$1.03	$0.68
	2nd Quarter	$0.94	$0.70
	3rd Quarter	$1.19	$0.87
	4th Quarter	$0.91	$0.74
2015	1st Quarter	$0.99	$0.74
	2nd Quarter	$0.93	$0.70
	3rd Quarter	$0.73	$0.59
	4th Quarter	$0.86	$0.51
2016	1st Quarter	$0.71	$0.44

As of June 2, 2016, we have a total of 65,601,501 shares of common stock outstanding, held by approximately 142 record shareholders and no shares of preferred stock outstanding.

Dividends

No cash dividends have been declared or paid on our common stock to date. No restrictions limit our ability to pay dividends on our common stock. The payment of cash dividends in the future, if any, will be contingent upon our Company's revenues and earnings, if any, capital requirements and general financial condition. The payment of any dividends is within the discretion of our board of directors. Our board of director's present intention is to retain all earnings, if any, for use in our business operations and, accordingly, the board of directors does not anticipate paying any cash dividends in the foreseeable future.

Securities Authorized for Issuance under Equity Compensation Plans

Equity Compensation Plans as of December 31, 2015

Equity Compensation Plan Information

Plan category	Number of securities to be issued upon exercise of outstanding options, warrants and rights (a)	Weighted-average exercise price of outstanding options, warrants and rights (b)	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a)) (c)
Equity compensation plans approved by security holders (1)	6,389,500	$0.83	2,266,600
Equity compensation plans not approved by security holders (2)	1,137,500	$0.99	0
Total	7,527,000	$0.86	2,266,600

1. Reflects our 2007 Employee Stock Plan for the benefit of our directors, officers, employees and consultants. We have reserved 10,000,000 shares of common stock for such persons pursuant to that plan.
2. Comprised of common stock purchase warrants we issued for services.

Penny Stock Regulations and Restrictions on Marketability

The SEC has adopted rules that regulate broker-dealer practices in connection with transactions in penny stocks. Penny stocks are generally equity securities with a market price of less than $5.00, other than securities registered on certain national securities exchanges or quoted on the NASDAQ system, provided that current price and volume information with respect to transactions in such securities is provided by the exchange or system. The penny stock rules require a broker-dealer, prior to a transaction in a penny stock, to deliver a standardized risk disclosure document prepared by the SEC, that: (a) contains a description of the nature and level of risk in the market for penny stocks in both public offerings and secondary trading; (b) contains a description of the broker's or dealer's duties to the customer and of the rights and remedies available to the customer with respect to a violation of such duties or other requirements of the securities laws; (c) contains a brief, clear, narrative description of a dealer market, including bid and ask prices for penny stocks and the significance of the spread between the bid and ask price; (d) contains a toll-free telephone number for inquiries on disciplinary actions; (e) defines significant terms in the disclosure document or in the conduct of trading in penny stocks; and (f) contains such other information and is in such form, including language, type size and format, as the SEC shall require by rule or regulation.

The broker-dealer also must provide, prior to effecting any transaction in a penny stock, the customer with (a) bid and offer quotations for the penny stock; (b) the compensation of the broker-dealer and its salesperson in the transaction; (c) the number of shares to which such bid and ask prices apply, or other comparable information relating to the depth and liquidity of the market for such stock; and (d) a monthly account statement showing the market value of each penny stock held in the customer's account.

In addition, the penny stock rules require that prior to a transaction in a penny stock not otherwise exempt from those rules, the broker-dealer must make a special written determination that the penny stock is a suitable investment for the purchaser and receive the purchaser's written acknowledgment of the receipt of a risk disclosure statement, a written agreement as to transactions involving penny stocks, and a signed and dated copy of a written suitability statement.

These disclosure requirements may have the effect of reducing the trading activity for our common stock. Therefore, stockholders may have difficulty selling our securities.

DILUTION

Shares of our common stock in this offering by the selling securityholders will not affect the rights or privileges of our existing stockholders, except that the economic and voting interests of each of our existing stockholders will be diluted as a result of any issuances of shares underlying the Warrants upon the exercise of any such Warrants by the selling securityholders. Although the number of shares of common stock that our existing stockholders own will not decrease, the shares owned by our existing stockholders will represent a smaller percentage of our total outstanding shares after any such issuances upon the exercise of the Warrants by the selling securityholders.

MANAGEMENT S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

The following management's discussion and analysis of financial condition and results of operations provides information that management believes is relevant to an assessment and understanding of our plans and financial condition. The following selected financial information is derived from our historical financial statements and should be read in conjunction with such financial statements and notes thereto set forth elsewhere herein and the Forward-Looking Statements explanation included herein.

Overview

We are a development stage, electro-optical device and organic nonlinear materials company. Our primary area of expertise is the chemical synthesis of chromophore dyes used in the development of organic Application Specific Electro-Optic Polymers (ASEOP) and organic Non-Linear All-Optical Polymers (NLAOP) that have high electro-optic and optical activity. Our family of materials are thermally and photo-chemically stable, which we believe could have utility across a broad range of applications in devices that address markets such as telecommunication, data communications, high-speed computing and photovoltaic cells. Secondarily, our Company is developing proprietary electro-optical and all-optical devices utilizing the advanced capabilities of our materials for applications in the fields mentioned above.

Electro-optic devices convert data from electric signals into optical signals for use in communications systems and in optical interconnects for high-speed data transfer. We expect our patented and patent-pending optical materials (chromophores), when combined with selected polymers to make ASEOP and NLAOP material systems and when completed and tested, to be the core of the future generations of optical devices, modules, sub-systems and systems that we will develop or be licensed by electro-optic device manufacturers, such as telecommunications component and systems manufacturers, networking and switching suppliers, semiconductor companies, aerospace companies and government agencies.

Our ASEOP material systems are property-engineered at the molecular level (nanotechnology level) to meet the exacting thermal, environmental and performance specifications demanded by electro-optic devices. We believe that our patented and patent pending technologies will enable us to design polymer based material systems that are free from the numerous diverse and inherent flaws that plague competitive polymer technologies employed by other companies and research groups. We engineer our polymer based material systems with the intent to have temporal, thermal, chemical and photochemical stability within our patented and patent pending molecular chromophore architectures.

Our non-linear all optical NLAOP material systems have demonstrated resonantly enhanced third-order properties approximately 2,630 times larger than fused silica, which means that they are highly photo-optically active in the absence of an RF circuit. In this way they differ from other polymer technologies and are considered more advanced next-generation materials.

Our revenue model relies substantially on the assumption that we will be able to successfully develop our polymer based material systems and photonic device products, which will use our polymer based material systems, for applications within the industries named below. When appropriate, we intend to create specific materials for each of these applications and use our proprietary knowledge base to continue to enhance its discoveries.

- cloud computing and data centers
- telecommunications/data communications
- backplane optical interconnects
- photovoltaic cells
- medical applications
- satellite reconnaissance
- navigation systems
- radar applications
- optical filters
- spatial light modulators
- all-optical switches

To be successful, we must, among other things:

- Develop and maintain collaborative relationships with strategic partners;
- Continue to expand our research and development efforts for our products;
- Develop and continue to improve on our manufacturing processes and maintain stringent quality controls;
- Produce commercial quantities of our products at commercially acceptable prices;
- Rapidly respond to technological advancements;
- Attract, retain and motivate qualified personnel; and
- Obtain and retain effective intellectual property protection for our products and technology.

We believe that Moore's Law (a principle which states the number of transistors on a silicon chip doubles approximately every eighteen months) will create markets for our high-performance electro-optic materials and photonic device products.

Plan of Operation

Since inception, we have been engaged primarily in the research and development of our polymer based material systems and photonic device products. We are devoting significant resources to engineer next-generation polymer based material systems for future applications to be utilized by electro-optic device manufacturers, such as telecommunications component and systems manufacturers, networking and switching suppliers, semiconductor companies, aerospace companies, government agencies and internal device development. We expect to continue to develop products that we intend to introduce to these rapidly changing markets and to seek to identify new markets. We expect to continue to make significant operating and capital expenditures for research and development activities.

As we move from a development stage company to a product supplier, we expect that our financial condition and results of operations will undergo substantial change. In particular, we expect to record both revenue and expense from product sales, to incur increased costs for sales and marketing and to increase general and administrative expense. Accordingly, the financial condition and results of operations reflected in our historical financial statements are not expected to be indicative of our future financial condition and results of operations.

Some of our more significant milestones that we achieved during 2014-2016 include:

In January 2014 we created a new methodology to combine multiple chromophores into a single polymer host that significantly improves their ability to generate more powerful organic, nonlinear electro-optical polymer systems. The new synthetic chemistry process can enable multiple chromophores (dyes) to work in concert with each other within a single polymer host. This proprietary process has created two new material systems, which have demonstrated outstanding electro-optic values. In addition, we now have a significant amount of data on the thermal aging of our materials. We have demonstrated that our materials can withstand more than 2,000 hours at 110 degrees C with little to no change in electro-optic activity in our materials, which is a significant milestone. To our knowledge, this is something that has not been achieved before in any polymer. We are also concurrently coating prototype waveguides with our proprietary material system.

In February 2014 we received our first purchase order for our advanced organic nonlinear electro-optic polymer from Boulder Nonlinear Systems (BNS) of Boulder, Colorado in connection with the development of a next generation LADAR system. A LADAR system is a radar system that utilizes a pulse laser to calculate the distance to a target, but is also capable of rendering a 3-D image. In the event BNS continues to move forward with the development of this LADAR system, we expect to receive additional purchase orders from BNS.

In March 2014 we began the process of manufacturing an advanced design Silicon Organic Hybrid Transceiver prototype and we released the completed chip design to the OpSIS Center at the University of Delaware who contracted with a third party to produce the initial silicon chips, which were delivered to us in December 2014 and January 2015. We are currently qualifying and testing these chips for utilization in our Silicon Organic Transceiver. The initial application will target inter-data center interconnections of more than 10 kilometers. Our next design will utilize a different frequency and address the current bottleneck in the rack-to-server layer at distances greater than 500 meters.

In April 2014 we entered into a sole worldwide license agreement with Corning Incorporated enabling us to integrate Corning's organic electro-optical chromophores into our portfolio of electro-optic polymer materials. The agreement allows us to use the licensed patents within a defined license field that includes communications, computing, power, and power storage applications utilizing the nonlinear optical properties of their materials.

In August 2014 the University of Colorado successfully fabricated and tested a bleached electro-optic waveguide modulator designed and fabricated through a sponsored collaborative research agreement. The results of this initial bleached waveguide modulator correlated well with previous electro-optic thin film properties. These initial results of our first in-house device were significant to our entire device program and were an important starting point for our current modulators that are being developed for target markets. We have multiple generations of new materials that we are optimizing for this specific design.

In October 2014 we submitted an order with Reynard Corporation to produce gold-layered fused silica substrates for our bleached waveguide modulators to be coated with several of our organic electro-optical polymers, which we received in early November 2014 and performance tested throughout December 2014. In May, 2015, we subsequently decided to eliminate this product from our commercial development plans due to its limited commercial value, low speed characteristics, difficulty to mass-produce and limited ability to integrate with existing architectures. In lieu of this development program, a commercially viable prototype ridge waveguide modulator program was started to replace the bleached waveguide development. We believe that the ridge waveguide modulator represents a viable telecom device opportunity for the Company that does not have the inherent limitations seen in bleached waveguide structures.

In May 2015 we achieved operating capability of our in-house Class 100 Clean Room where we do thin film processing and expect to complete the development of prototype photonic devices enabled by our advanced organic electro-optic polymer material systems in a timelier manner. Additionally, the Joint Institute for Laboratory Astrophysics (JILA) certified three of our employees, which allows us access to JILA s world-class semiconductor facility located at the University of Colorado, Boulder. Access to this facility provides us with better control over the quality of our development work and the speed at which it progresses.

In August 2015 we completed 2,000+ hours of thermal aging tests of several blends of materials created by our multi-chromophore process, which included lengthy exposure to high temperatures (85^0C and 110^0C). The data collected indicated minimal loss of electro-optical activity (R_{33}) of our materials, which means that our organic polymers are expected to provide decades of operational performance. These results exceed previously published efforts for other organic polymers and are an important part of our commercialization effort as we begin to implement these material systems into advanced photonic devices for the telecom and datacom markets.

Additionally, in August 2015, we completed 500+ hours of photochemical stability testing of our material candidates by exposing them to the visible light spectrum. The data collected indicated no discernible change in the chemical structures in an oxygen free environment. An accepted industry standard is 2,000 hours. This stability testing was begun to help us understand more clearly the processing and manufacturing requirements of our future commercial products, and provide initial assurances to expect the same results as we move these materials into actual photonic device structures.

In October 2015, we successfully surpassed 2,000 hours of photochemical stability testing of our material candidates with little to no change in the electro-optic characteristics (R_{33}) of our material; and, in January 2016, we successfully surpassed 4,000 hours of photochemical stability testing of our material candidates with little to no change in the electro-optic characteristics (R_{33}) of our material. These photochemical stability test results, along with the thermal stability at 110°C, should enable the Company to demonstrate that organic polymers can compete head-to-head with inorganic crystalline legacy telecom and datacom devices which currently provide the backbone for the entire infrastructure that converts almost incalculable amounts of electronic (binary) data into pulses of light and back on a daily basis.

In November of 2015, we successfully fabricated ridge waveguide structures from our core material system. At the same time we successfully developed a proprietary methodology to segment individual chips from our silicon wafers that contain our ridge waveguide devices. These critical steps in our process provide us with a clear path towards a commercial telecommunication device. These same processes can be used for the fabrication of modulators to be used in data centers. The individual chips are now being analyzed and passively tested in our Longmont, CO optical test facility. We continue to move towards completion of an operating organic polymer-enabled ridge waveguide modulator prototype using our new multi-chromophore material systems.

In February 2016, we successfully guided laser single-mode light through 16 of our passive single-mode ridge waveguides made entirely out of our advanced organic polymer systems, which are the building block of waveguide modulators that achieve high modulator performance. As a result, our commercialization effort has entered the next phases of development: passive-waveguide loss measurements, followed by the development and active testing of electro-optic modulators. Utilizing continuous-wave input laser light, electro-optic modulators convert digital (binary) electrical data into output pulses of light that can be transported across fiber optical communication networks. Active testing is accomplished by applying an electrical signal to a modulator and evaluating the resulting output optical signal.

In April 2016, we successfully achieved modulation of light in our first in-house all-polymer ridge waveguide modulator prototype. This important step towards commercialization proved that our proprietary organic polymer systems could modulate light in an in-house designed and produced ridge waveguide modulator. We expect this significant achievement to eventually lead to high-speed, low input voltage modulators capable of penetrating the current market. We are still testing and modifying the poling profiles in prototype devices to duplicate the results seen in previous Teng Mann R33 material testing.

Presently, we are continuing to move towards completion of our operating organic polymer-enabled ridge waveguide modulator prototype using our new multi-chromophore material systems.

We ultimately intend to use our next-generation electro-optic polymer material systems and non-linear all-optical polymer material systems for future applications vital to the following industries. We expect to create specific materials for each of these applications as appropriate:

- Cloud computing and data centers
- Telecommunications/data communications
- Backplane optical interconnects
- Photovoltaic cells
- Medical applications
- Satellite reconnaissance
- Navigation systems
- Radar applications
- Optical filters
- Spatial light modulators
- All-optical switches

In an effort to maximize our future revenue stream from our electro-optic polymer material systems and non-linear all-optical polymer material systems, our business model anticipates that our revenue stream will be derived from one or some combination of the following: (i) technology licensing for specific product applications; (ii) joint venture

relationships with significant industry leaders; (iii) the production and direct sale of our own photonic device components; or (iv) the vertical integration of our modulator into a transceiver device . Our objective is to be a leading provider of proprietary technology and know-how in the photonic device markets. In order to meet this objective, subject to successful testing of our technology and having available financial resources, we intend to:

- Develop electro-optic polymer material systems and non-linear all-optical polymer material systems and photonic devices;
- Continue to develop proprietary intellectual property;
- Streamline our product development process;
- Develop a comprehensive marketing plan;
- Maintain/develop strategic relationships with government agencies, private firms, and academic institutions; and
- Continue to attract and retain high level science and technology personnel to our Company.

Our Proprietary Products in Development

As part of a two-pronged marketing strategy, our Company is developing several devices, which are in various stages of development that utilize our organic nonlinear optical materials.

They include:

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Ridge waveguide modulator

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Slot waveguide modulator

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Spatial light modulator

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100 Gbps telecommunications modulator

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200 Gbps datacomm/telecomm photonic transceiver

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Integrated photonic system

Additionally, we must continue to create and maintain an infrastructure, including operational and financial systems, and related internal controls, and recruit qualified personnel. Failure to do so could adversely affect our ability to support our operations.

Capital Requirements

As a development stage company, we do not generate revenues. We have incurred substantial net losses since inception. We have satisfied our capital requirements since inception primarily through the issuance and sale of our common stock. During 2014 we received $4,329,978 in cash proceeds from the issuance and sale of our common stock. On June 15, 2015, we completed a private placement of our securities where we raised $1,915,000 in total proceeds. On December 30, 2015, we completed a private placement of our securities where we raised $2,400,000 in total proceeds.

Results of Operations

Comparison of three months ended March 31, 2016 to three months ended March 31, 2015

Revenues

As a development stage company, we had no revenues during the three months ended March 31, 2016 and March 31, 2015. The Company is in various stages of material and photonic device development and evaluation. We expect the next revenue stream to be in product development agreements, prototype devices and sale of nonlinear optical polymer materials prior to moving into production.

Operating Expenses

Our operating expenses were $1,059,311 and $1,065,452 for the three months ended March 31, 2016 and 2015, respectively, for a decrease of $6,141. This decrease in operating expenses was due primarily to decreases in outsourced testing and product development expenses, research and development non-cash stock option and warrant amortization and research and development travel expenses offset by increases in research and development consulting fees, salaries and wages, legal expenses and laboratory materials and supplies.

Included in our operating expenses for the three months ended March 31, 2016 was $603,263 for research and development expenses compared to $645,206 for the three months ended March 31, 2015, for a decrease of $41,943. Outsourced testing and prototype development were brought in-house with the completion of the Company s clean room and optical testing operations. The decrease in research and development expenses is primarily due to decreases in outsourced testing and product development expenses, non-cash stock option and warrant amortization and travel expenses offset by increases in consulting fees, salaries and wages and laboratory materials and supplies.

Research and development expenses currently consist primarily of compensation for employees engaged in internal research, product development activities; laboratory operations, internal material and device testing and prototype electro-optic device design, development and prototype device processing; costs; and related operating expenses.

We expect to continue to incur substantial research and development expense to develop and commercialize our photonic devices and electro-optic materials platform. These expenses will increase as a result of accelerated development effort to support commercialization of our non-linear optical polymer materials technology; to build

photonic device prototypes in our in-house laboratories; hiring additional technical and support personnel; engaging a senior technical advisor; pursuing other potential business opportunities and collaborations; customer testing and evaluation; and incurring related operating expenses.

Laboratory material testing expense and electro-optic device development decreased $88,932 from $113,649 for the three months ended March 31, 2015 to $24,717 for the three months ended March 31, 2016.

Research and development non-cash stock option amortization decreased $16,032 from $103,568 for the three months ended March 31, 2015 to $87,536 for the three months ended March 31, 2016.

Travel expenses decreased $6,120 from $19,556 for the three months ended March 31, 2015 to $13,436 for the three months ended March 31, 2016.

Consulting expenses increased $32,759 from $22,594 for the three months ended March 31, 2015 to $55,353 for the year ended March 31, 2016.

Wages and salaries with fringe benefits increased $24,571 from $259,222 for the three months ended March 31, 2015 to $283,793 for the three months ended March 31, 2016.

Laboratory materials and supplies increased $6,766 from $40,921 for the three months ended March 31, 2015 to $47,687 for the three months ended March 31, 2016.

General and administrative expense consists primarily of compensation and support costs for management staff, and for other general and administrative costs, including executive, sales and marketing, investor relations, accounting and finance, legal, consulting and other operating expenses.

General and administrative expenses increased $35,802 to $456,048 for the three months ended March 31, 2016 compared to $420,246 for the three months ended March 31, 2015. The increase is due primarily to increases in salaries and wages and legal expenses.

General and Administrative wages and salaries increased $21,261 from $111,374 for the three months ended March 31, 2015 to $132,635 for the three months ended March 31, 2016.

Legal fees increased $11,517 to $54,811 for the three months ending March 31, 2016 from $43,294 for the three months ended March 31, 2015.

We expect general and administrative expense to increase in future periods as we increase the level of corporate and administrative activity, including increases associated with our operation as a public company; and significantly increase expenditures related to the future production and sales of our products.

Other Income (Expense)

Other income (expense) increased ($237,960) to ($237,899) for the three months ended March 31, 2016 from $61 for the three months March 31, 2015, relating primarily to the initial commitment fee associated with the 2016 purchase agreement with an institutional investor.

Net Loss

Net loss was $1,297,210 and $1,065,391 for the three months ended March 31, 2016 and 2015, respectively, for an increase of $231,819, due primarily to increases in commitment fee associated with the 2016 purchase agreement with an institutional investor, research and development consulting fees, salaries and wages, legal expenses and laboratory materials and supplies offset by decreases in outsourced testing and product development expenses, research and development non-cash stock option and warrant amortization and research and development travel expenses.

Comparison of fiscal 2015 to fiscal 2014

Revenues

As a development stage company, we had revenues of $0 during for the year ended December 31, 2015 and $2,500 for the year ended December 31, 2014. The Company is in various stages of material and photonic device development and evaluation. We expect the next revenue stream to be in product development agreements, prototype devices and sale of nonlinear optical polymer materials prior to moving into production.

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Operating Expenses

Our operating expenses were $4,845,681 and $4,395,684 for the years ended December 31, 2015 and 2014, respectively, for an increase of $449,997. This increase in operating expenses was due primarily to increases in non-cash amortization of options and warrants, salaries and wages, investor relation expenses, laboratory materials and supplies, disposal of obsolete material and equipment, research and development rent and utility expenses, depreciation, research and development consulting fees and annual shareholder meeting expenses offset by decreases in outsourced testing and product development expenses, license fees, general and administrative office expenses, accounting fees, travel expenses, legal expenses and general and administrative consulting fees.

Included in our operating expenses for the year ended December 31, 2015 was $2,825,099 for research and development expenses compared to $2,849,620 for the year ended December 31, 2014, for a decrease of $24,521. Outsourced testing and prototype development were brought in-house with the completion of the Company s clean room and optical testing operations. The decrease in research and development expenses is primarily due to decreases in outsourced testing and product development expenses and license fees offset by increases in salaries and wages, laboratory materials and supplies, disposal of obsolete material and equipment, research and development rent and utilities, depreciation expense, consulting fees and non-cash stock option and warrant amortization.

Research and development expenses currently consist primarily of compensation for employees engaged in internal research, product development activities; laboratory operations, internal material and device testing and prototype electro-optic device design, development and prototype device processing; costs; and related operating expenses.

We expect to continue to incur substantial research and development expense to develop and commercialize our photonic devices and electro-optic materials platform. These expenses will increase as a result of accelerated development effort to support commercialization of our non-linear optical polymer materials technology; to build photonic device prototypes in our in-house laboratories; hiring additional technical and support personnel; engaging a senior technical advisor; pursuing other potential business opportunities and collaborations; customer testing and evaluation; and incurring related operating expenses.

Laboratory material testing expense and photonic device development decreased $230,764 from $526,531 for the year ended December 31, 2014 to $295,767 for the year ended December 31, 2015.

Wages and salaries and benefits increased $90,243 from $942,728 for the year ended December 31, 2014 to $1,032,971 for the year ended December 31, 2015.

Laboratory materials and supplies increased $63,176 from $140,939 for the year ended December 31, 2014 to $204,115 for the year ended December 31, 2015.

License fees decreased $30,000 to $0 for the year ended December 31, 2015 from $30,000 for the year ended December 31, 2014 for the license fee paid to Corning in accordance with a license agreement.

Consulting expenses increased $10,590 from $71,834 for the year ended December 31, 2014 to $82,424 for the year ended December 31, 2015.

Disposal of obsolete material and equipment increased $20,860 from $3,981 for the year ended December 31, 2014 to $24,841 for the year ended December 31, 2015.

Non-cash stock compensation and stock option and warrant amortization increased $9,390 from $750,729 for the year ended December 31, 2014 to $760,119 for the year ended December 31, 2015.

Rent expense increased $14,666 from $109,659 for the year ended December 31, 2014 to $124,325 for the year ended December 31, 2015 the optical lab and clean room facility in Colorado.

Depreciation expense increased $22,763 from $130,498 for the year ended December 31, 2014 to $153,261 for the year ended December 31, 2015 primarily due to the additional equipment purchased for the Company s Delaware and Colorado laboratory facilities.

General and administrative expense consists primarily of compensation and support costs for management staff, and for other general and administrative costs, including executive, sales and marketing, investor relations, accounting and finance, legal, consulting and other operating expenses.

General and administrative expenses increased $474,518 to $2,020,582 for the year ended December 31, 2015 from $1,546,064 for the year ended December 31, 2014. The increase is due primarily to increases in non-cash amortization of options and warrants, investor relations expenses, salaries and wages and annual shareholder meeting expenses offset by a decrease in office expenses, accounting fees, travel expenses, legal expenses and consulting fees.

Non-cash stock compensation and stock option amortization increased $448,158 from $222,678 for the year ended December 31, 2014 to $670,836 for the year ended December 31, 2015.

Investor relations expenses increased by $51,592 from $40,546 for the year ended December 31, 2014 to $92,138 for the year ended December 31, 2015.

Wages and salaries and benefits increased $28,276 from $543,820 for the year ended December 31, 2014 to $572,096 for the year ended December 31, 2015.

Expenses for the annual shareholder meeting increased $13,843 from $37,310 for the year ended December 31, 2014 to $51,153 for the year ended December 31, 2015.

Office expenses including administrative and receptionist expenses decreased $26,889 from $56,720 for the year ended December 31, 2014 to $29,831 for the year ended December 31, 2015 for expenses related to the Company s new headquarter and optical lab in Colorado.

Accounting fees decreased $10,930 from $99,453 for the year ended December 31, 2014 to $88,523 for the year ended December 31, 2015.

Travel expenses decreased $10,691 from and $61,826 for the year ended December 31, 2014 to $51,135 for the year ended December 31, 2015.

Legal fees decreased $8,329 to $171,728 for the year ended December 31, 2015 from $180,057 for the year ended December 31, 2014.

Consulting fees decreased $10,711 from $20,565 for the year ended December 31, 2014 to $9,854 for the year ended December 31, 2015.

We expect general and administrative expense to increase in future periods as we increase the level of corporate and administrative activity, including increases associated with our operation as a public company; and significantly increase expenditures related to the future production and sales of our products.

Other Income (Expense)

Other income (expense) increased $16,862 to $249 for the year ending December 31, 2015 from ($16,613) for the year ending December 31, 2014, relating primarily to the commitment fee associated with the purchase of shares by an institutional investor for sale under a stock purchase agreement during 2014.

Net Loss

Net loss was $4,845,432 and $4,409,797 for the years ended December 31, 2015 and 2014, respectively, for an increase of $435,635 due primarily to increases in non-cash amortization of options and warrants, salaries and wages, investor relation expenses, laboratory materials and supplies, disposal of obsolete material and equipment, research and development rent and utility expenses, depreciation, research and development consulting fees and annual shareholder meeting expenses offset by decreases in outsourced testing and product development expenses, license fees, general and administrative office expenses, accounting fees, travel expenses, legal expenses and general and administrative consulting fees.

Significant Accounting Policies

Our discussion and analysis of our financial condition and results of operations are based on our financial statements, which have been prepared in accordance with accounting principles generally accepted in the United States. The preparation of these financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses, and related disclosure of contingent assets and liabilities. On an ongoing basis, we evaluate our estimates based upon historical experience and various other assumptions that we believe to be reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Although these estimates are based on our management s best knowledge of current events and actions our Company may undertake in the future, actual results could differ from the estimates.

Our Company's accounting policies are more fully described in Note 1 of the notes to our audited financial statements for the year ended December 31, 2015 unaudited financial statements for the three months ended March 31, 2016 (the Financial Statements). As disclosed in Note 1 of the Financial Statements, the preparation of financial statements in conformity with accounting principles generally accepted in the United States requires management to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying disclosures.

Stock Based Compensation

Our Company uses the Black-Scholes option pricing model to calculate the grant-date fair value of an award, with the following assumptions for 2015 and 2014: no dividend yield in both years, expected volatility, based on the Company s historical volatility, 75% to 79% in 2015 and between 70.25% to 109% in 2014, risk-free interest rate between 1.44% to 1.70% in 2015 and between 0.58% to 2.08% in 2014 and expected option life of 5 to 5.75 years in 2015 and 2.13 to 7.25 years in 2014.

As of December 31, 2015, there was $209,618 of unrecognized compensation expense related to non-vested market-based share awards that is expected to be recognized through August 2018.

Liquidity and Capital Resources

During the three months ended March 31, 2016, net cash used in operating activities was $677,687 and net cash used in investing activities was $31,284, which was due primarily to the Company s research and development activities

and general and administrative expenditures. Net cash provided by financing activities for the three months ended March 31, 2016 was $0. At March 31, 2016, our cash and cash equivalents totaled $3,021,734, our assets totaled $4,238,815, our liabilities totaled $129,221, and we had stockholders equity of $4,109,594.

During the year ended December 31, 2015, net cash used in operating activities was $3,440,755 and net cash used in investing activities was $309,480, which was due primarily to the Company s research and development activities and general and administrative expenditures. Net cash provided by financing activities for the year ended December 31, 2015 was $4,315,000. At December 31, 2015, our cash and cash equivalents totaled $3,730,705, our assets totaled $5,110,025, our liabilities totaled $102,957, and we had stockholders equity of $5,007,068.

During the year ended December 31, 2014, net cash used in operating activities was $3,140,203 and net cash used in investing activities was $294,539, which was due primarily to the Company s research and development activities and general and administrative expenditures. Net cash provided by financing activities for the year ended December 31, 2014 was $4,329,978. At December 31, 2014, our cash and cash equivalents totaled $3,165,940, our assets totaled $4,279,423, our liabilities totaled $221,841, and we had stockholders equity of $4,057,582.

Sources and Uses of Cash

Our future expenditures and capital requirements will depend on numerous factors, including: the progress of our research and development efforts; the rate at which we can, directly or through arrangements with original equipment manufacturers, introduce and sell products incorporating our polymer materials technology; the costs of filing, prosecuting, defending and enforcing any patent claims and other intellectual property rights; market acceptance of our products and competing technological developments; and our ability to establish cooperative development, joint venture and licensing arrangements. We expect that we will incur approximately $3,480,000 of expenditures over the next 12 months. Our cash requirements are expected to increase at a rate consistent with the Company s path to revenue growth as we expand our activities and operations with the objective of commercializing our electro-optic polymer technology during 2016.

Our business does not presently generate the cash needed to finance our current and anticipated operations. We believe we have raised sufficient capital to finance our operations through January 2017; however, we will need to obtain additional future financing after that time to finance our operations until such time that we can conduct profitable revenue-generating activities. Such future sources of financing may include cash from equity offerings, exercise of stock options, warrants and proceeds from debt instruments; but we cannot assure you that such equity or borrowings will be available or, if available, will be at rates or prices acceptable to us.

On January 29, 2016, we signed a Purchase Agreement with Lincoln Park to sell up to $20,000,000 of common stock whereby subject to certain conditions and at our sole discretion, Lincoln Park has committed to purchase up to $20,000,000 of our common stock over a 36-month period. In April 2016 our registration statement became effective, which registered for resale by Lincoln Park under the Purchase Agreement 5,000,000 shares of our common stock, 350,000 of which have already been issued as a commitment fee and 4,650,000 of which may be sold by us to Lincoln Park during the term of the Purchase Agreement. Pursuant to the Purchase Agreement, Lincoln Park is obligated to make purchases as the Company directs in accordance with the Purchase Agreement, which may be terminated by the Company at any time, without cost or penalty. Sales of shares will be made in specified amounts and at prices that are based upon the market prices of our common stock immediately preceding the sales to Lincoln Park. We expect this financing to provide us with sufficient funds to maintain our operations for the foreseeable future. With the additional capital, we expect to achieve a level of revenues attractive enough to fulfill our development activities and adequate enough to support our business model for the foreseeable future. We cannot assure you that we will meet the conditions of the Purchase Agreement with Lincoln Park in order to obligate Lincoln Park to purchase our shares of common stock. In the event we fail to do so, and other adequate funds are not available to satisfy long-term capital requirements, or if planned revenues are not generated, we may be required to substantially limit our operations. This limitation of operations may include reductions in capital expenditures and reductions in staff and discretionary costs.

There are no trading volume requirements or restrictions under the Purchase Agreement and we will control the timing and amount of any sales of our common stock to Lincoln Park. Lincoln Park has no right to require any sales by us, but is obligated to make purchases from us as we direct in accordance with the Purchase Agreement. We can also accelerate the amount of common stock to be purchased under certain circumstances. There are no limitations on use of proceeds, financial or business covenants, restrictions on future funding, rights of first refusal, participation rights, penalties or liquidated damages in the Purchase Agreement. Lincoln Park may not assign or transfer its rights and obligations under stock the Purchase Agreement.

We expect that our cash used in operations will increase during 2016 and beyond as a result of the following planned activities:

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The addition of management, sales, marketing, technical and other staff to our workforce;

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Increased spending for the expansion of our research and development efforts, including purchases of additional laboratory and production equipment;

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Increased spending in marketing as our products are introduced into the marketplace;

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Developing and maintaining collaborative relationships with strategic partners;

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Developing and improving our manufacturing processes and quality controls; and

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Increases in our general and administrative activities related to our operations as a reporting public company and related corporate compliance requirements.

Analysis of Cash Flows

For the three months ended March 31, 2016

Net cash used in operating activities was $677,687 for the three months ended March 31, 2016, primarily attributable to the net loss of $1,297,210 adjusted by $23,715 in warrants issued for services, $132,056 in options issued for services, $243,965 in common stock issued for services, $49,431 in depreciation expenses and patent amortization expenses, $144,092 in prepaid expenses and $26,264 in accounts payable and accrued expenses. Net cash used in operating activities consisted of payments for research and development, legal, professional and consulting expenses, rent and other expenditures necessary to develop our business infrastructure.

Net cash used by investing activities was $31,284 for the three months ended March 31, 2016, consisting of $10,450 in cost for intangibles and $20,834 in asset additions primarily for the new lab facility.

Net cash provided by financing activities was $0 for the three months ended March 31, 2016.

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For the year ended December 31, 2015

Net cash used in operating activities was $3,440,755 for the year ended December 31, 2015, primarily attributable to the net loss of $4,845,432 adjusted by $91,263 in warrants issued for services, $1,339,692 in options issued for services, $48,963 in common stock issued for services, $179,907 in depreciation expenses and patent amortization expenses, ($136,264) in prepaid expenses and other current assets and ($118,884) in accounts payable and accrued expenses. Net cash used in operating activities consisted of payments for research and development, legal, professional and consulting expenses, rent and other expenditures necessary to develop our business infrastructure.

Net cash used by investing activities was $309,480 for the year ended December 31, 2015, consisting of $29,577 in cost for intangibles and $279,903 in asset additions primarily for the new lab facility.

Net cash provided by financing activities was $4,315,000 for the year ended December 31, 2015 and consisted of $4,315,000 proceeds from private placement.

For the year ended December 31, 2014

Net cash used in operating activities was $3,140,203 for the year ended December 31, 2014, primarily attributable to the net loss of $4,409,797 adjusted by $148,681 in warrants issued for services, $824,726 in options issued for services, $41,362 in common stock issued for services, $151,183 in depreciation expenses and patent amortization expenses, $3,977 in prepaid expenses and $99,665 in accounts payable and accrued expenses. Net cash used in operating activities consisted of payments for research and development, legal, professional and consulting expenses, rent and other expenditures necessary to develop our business infrastructure.

Net cash used in investing activities was $294,539 for the year ended December 31, 2014, consisting of $81,350 in cost for intangibles and $213,189 in asset additions primarily for the new lab facility.

Net cash provided by financing activities was $4,329,978 for the year ended December 31, 2014 and consisted of $3,140,000 proceeds from private placement, $1,036,148 in proceeds from sale of common stock to an institutional investor and $153,830 from the exercise of options and warrants.

Inflation and Seasonality

We do not believe that our operations are significantly impacted by inflation. Our business is not seasonal in nature.

BUSINESS

Lightwave Logic, Inc. is developing a new generation of advanced organic nonlinear chromophores to be used to make electro-optic polymer material systems and non-linear all-optical polymer material systems. We are developing a new generation of photonic devices that utilize our unique polymer based material systems. These polymer based material systems, when used in modulators or waveguide structures, can convert high-speed electronic signals into optical (light) signals for use in communications systems, high-speed data transfer or advanced high speed computing. Our Company is developing proprietary all-optical devices utilizing the advanced capabilities of our materials for the application mentioned above. These all-optical devices use light waves to switch other light waves meaning these material systems have third-order properties.

Inorganic material with electro-optic characteristics is the core active ingredient in high-speed fiber-optic telecommunication systems. Utilizing our proprietary technology, we are in the process of engineering advanced organic electro-optic polymer material systems that we believe may lead to significant performance advancements, component size and cost reduction, ease of processing, and thermal and temporal stability. We believe that our electro-optic polymer material systems engineered at the molecular level may have a significant role in the future development of commercially significant electro-optic related products.

Our organic electro-optic polymer material systems work by affecting the optical properties of light in the presence of an electric field at extremely high frequencies (wide bandwidths), but possess inherent advantages to inorganic materials.

Currently, the core electro-optic material contained in most modulators is a crystalline material, such as lithium niobate, indium phosphide and gallium arsenide. The following chart describes some of the characteristics of crystalline materials and electro-optical polymers.

Crystalline Materials	**Electro-optical Polymers**
Must be manufactured in strict dust-free conditions since even slight contamination can render them inoperable	Capable of being manufactured in less stringent environmental conditions. Capable of being tailored at the molecular level for optimal performance characteristics
More expensive to manufacture	Less expensive to manufacture
Limited to telecommunication speeds that are less than 40Gb/s (40 billion digital bits of data per second)	Demonstrated the ability to perform at speeds that are greater than 100Gb/s (100 billion digital bits of data per second)
Lithium niobate devices require large power levels (modulation voltages) to operate and are large in size --	Require significantly lower power levels, up to 60% less (modulation voltages) to operate and are capable of

typically measuring about four inches long (considering that most integrated circuits are literally invisible to the naked eye, these devices are enormous)	miniaturization
Requires more elaborate, expensive mechanical packaging (housings) generally comprised of materials, such as gold-plated Kovar, in order to assure operational integrity over required time and operating temperature ranges	Initial tests indicate no requirement for more elaborate, expensive packaging (housings)

We consider organic polymers with electro-optic qualities to be the most feasible technology for future high-speed (wide bandwidth) electronic-optical conversion. Due to the ease of processing afforded by electro-optic polymers, as well as their capacity to foster component size reduction, we believe electro-optic polymers have the potential to replace more expensive, lower-performance materials and devices used in fiber-optic ground, wireless and satellite communication networks that are used today in commercial and military telecommunications and advanced computational systems.

We also believe potential future applications may include: (i) cloud computing and data centers; (ii) telecommunications/data communications; (iii) backplane optical interconnects; (iv) photovoltaic cells; (v) medical applications; (vi) satellite reconnaissance; (vii) navigation systems; (viii) radar applications; (ix) optical filters; (x) spatial light modulators; and (xi) all-optical switches.

Our Electro-Optic Technology Approach

Our proposed solution to produce high-performance, high-stability electro-optic polymers for high-speed (wide bandwidth) telecommunication applications lies in a less mainstream, yet firmly established, scientific phenomenon called aromaticity. Aromaticity causes a high degree of molecular stability. It is a molecular arrangement wherein atoms combine into multi-membered rings and share their electrons among each other. Aromatic compounds are stable because the electronic charge distributes evenly over a great area preventing hostile moieties, such as oxygen and free radicals, from finding an opening to attack.

For the past two decades, diverse corporate interests, including, to our knowledge, IBM, Lockheed Martin, DuPont, AT&T Bell Labs, Honeywell and 3M, as well as numerous universities and U.S. Government Agencies, have been attempting to produce high-performance, high-stability electro-optic polymers for high-speed (wide bandwidth) telecommunication applications. These efforts have largely been unsuccessful due, in our opinion, to the industry's singular adherence to an industry pervasive engineering model known as the Bond Length Alternation (BLA) theory model. The BLA model, like all other current industry-standard molecular designs, consists of molecular designs containing long strings of atoms called polyene chains. Longer polyene chains provide higher electro-optic performance, but are also more susceptible to environmental threats, which result in unacceptably low-performing, thermally unstable electro-optic polymers.

As a result, high frequency modulators engineered with electro-optic polymers designed on the BLA model or any other polyene chain design models are unstable over typical operating temperature ranges, and often exhibit performance degradation within days, hours or even minutes. Similarly, lower frequency modulators exhibit comparable failings, but to a lesser extent. These flaws, in most cases, have prevented commercial quality polymer-based modulators operating at 10-40Gb/s from entering the commercial marketplace. The thermal stability of these devices does not generally meet the minimum Telcordia GR-468 operating temperature range (-40 degrees Celsius to +85 degrees Celsius) much less the more harsh MILSPEC 883D (military specification) range of -55 degrees Celsius to 150 degrees Celsius.

None of our patented molecular designs rely on the BLA polyene chain design model.

Our Intellectual Property

Issued U.S. Patents:

- Heterocyclical Chromophore Architectures (Granted April 5, 2011)
- Tricyclic Spacer Systems for Nonlinear Optical Devices (Granted February 22, 2011)
- Heterocyclical Chromophore Architectures (Granted September 18, 2012)
- Tricyclic Spacer Systems for Nonlinear Optical Devices (Granted- October 30, 2012)

Issued Australian Patents:

- Heterocyclical Chromophore Architectures (Granted November 29, 2012)

Allowed Japanese Patents:

- Heterocyclical Chromophore Architectures (Granted March 19, 2013)

We have twenty-four pending patent applications (including six patent families with applications in Australia, Canada, China, European Patent Office, Japan and the U.S. based on the PCT and U.S. applications below) in the field of nonlinear optic chromophore design as follows:

- Stable Free Radical Chromophores, processes for preparing the same
- Stable Free Radical Chromophores, processes for preparing the same
- Tricyclic Spacer Systems for Nonlinear Optical Devices
- Anti-Aromatic Chromophore Architectures
- Heterocyclical Anti-Aromatic Chromophore Architectures
- Heterocyclical Chromophore Architectures
- Heterocyclical Chromophore Architectures with Novel Electronic Acceptor Systems

Heterocyclical Anti-Aromatic Systems Two of our provisional patents cover heterocyclical anti-aromatic electronic conductive pathways, which are the heart of our high-performance, high-stability molecular designs. The completely heterocyclical nature of our molecular designs lock conductive atomic orbitals into a planar (flat) configuration, which provides improved electronic conduction and a significantly lower reaction to environmental threats (e.g. thermal, chemical, photochemical, etc.) than the BLA design paradigm employed by other competitive electro-optic polymers.

The anti-aromatic nature of these structures dramatically improves the zwitterionic-aromatic push-pull of the systems, providing for low energy charge transfer. Low energy charge transfer is important for the production of extremely high electro-optic character.

Heterocyclical Steric Hindering System This patent describes a nitrogenous heterocyclical structure for the integration of steric hindering groups that are necessary for the nanoscale material integration. Due to the [pi]-orbital configuration of the nitrogen bridge, this structure has been demonstrated not to interfere with the conductive nature of the electronic conductive pathway and thus is non-disruptive to the electro-optic character of the core molecular construction. The quantum mechanical design of the system is designed to establish complete molecular planarity (flatness) for optimal performance.

Totally Integrated Material Engineering System This patent covers material integration structures under a design strategy known as Totally Integrated Material Engineering. These integration structures provide for the wrapping of the core molecule in sterically hindering groups that maximally protect the molecule from environmental threats and maximally protect it from microscopic aggregation (which is a major cause of performance degradation and optical loss) within a minimal molecular volume. These structures also provide for the integration of polymerizable groups for integration of materials into a highly stable cross-linked material matrix.

Historic Breakthroughs and Results

During 2004, independent quantum mechanical calculations performed on our electro-optic polymer designs at government laboratories located at the Naval Air Warfare Center Weapons Division in China Lake, California suggested that our initial aromatic molecules perform two and a half (2.5) to three and three-tenths (3.3) times more efficiently than currently available telecom grade electro-optic polymers. Our conclusion was that performance improvements of this magnitude indicate a significant breakthrough in the field of fiber-optic telecommunication.

In May and June of 2006, performance evaluations of one of our first extremely high-performance electro-optic materials were performed by electro-optic expert, Dr. C.C. Teng, co-inventor of the renowned Teng-Man test, and subsequently confirmed by the University of Arizona's College of Optical Sciences. Under identical laboratory

conditions at low molecular loadings, one of our molecular designs outperformed one of the industry's highest performance electro-optic systems by a factor as high as 650%. Our conclusion was that the Teng-Man test established the validity of our novel, patent pending molecular design paradigm known as CSC (Cyclical Surface Conduction) theory; and that the success of CSC theory has the potential to establish the fundamental blueprint of electro-optic material design for decades to come, and to have broad application in commercial and military telecommunication and advanced computational systems.

On September 25, 2006 we obtained independent laboratory results that confirmed the thermal stability of our Perkinamine electro-optic materials. Thermal stability as high as 350 degrees Celsius was confirmed, significantly exceeding many other then commercially available high performance electro-optic materials, such as CLD-1 that exhibits thermal degradation in the range of 250 degrees Celsius to 275 degrees Celsius. This high temperature stability of our materials eliminates a major obstacle to vertical integration of electro-optic polymers into standard microelectronic manufacturing processes (e.g. wave/vapor-phase soldering) where thermal stability of at least 300 degrees Celsius is required. In independent laboratory tests, ten-percent material degradation, a common evaluation of overall thermal stability, did not occur until our Perkinamine materials base was exposed to temperatures as high as 350 degrees Celsius, as determined by Thermo-Gravimetric Analysis (TGA). The test results supported our Company's progress to introduce our materials into commercial applications such as optical interconnections, high-speed telecom and datacom modulators, and military/aerospace components.

On September 26, 2006, we were awarded the 2006 Electro-Optic Materials Technology Innovation of the Year Award by Frost & Sullivan. Frost & Sullivan's Technology Innovation of the Year Award is bestowed upon candidates whose original research has resulted in innovations that have, or are expected to bring, significant contributions to multiple industries in terms of adoption, change, and competitive posture. This award recognizes the quality and depth of our Company's research and development program as well as the vision and risk-taking that enabled us to undertake such an endeavor.

In July 2007, our Company developed an innovative process to integrate our unique architecture into our anticipated commercial devices, whereby dendritic spacer systems are attached to its core chromophore. In the event we are successful in developing a commercially viable product, we believe these dendrimers will reduce the cost of manufacturing materials and reduce the cost and complexity of tailoring the material to specific customer requirements.

In March 2008, we commenced production of our first prototype photonic chip, which we delivered to Photon-X, LLC to fabricate a prototype polymer optical modulator and measure its technical properties. In June 2009 we released test results conducted by Dr. C.C. Teng that re-confirmed our previous test results.

In August 2009, Photon-X, LLC commenced a compatibility study, process sequences, and fabricated wafers/chips containing arrays of phase modulators. The first one hundred plus modulators (bench top devices) were completed at the end of October 2009, and were successfully characterized for insertion loss, Vpi, modulation dynamic range and initial frequency response in March 2010. The multi-step manufacturing process we utilized to fabricate our modulators involved exposing our proprietary Perkinamine materials to extreme conditions that are typically found in standard commercial manufacturing settings. Our step-by-step analysis throughout the fabrication process demonstrated to us that our Perkinamine materials could successfully withstand each step of the fabrication process without damage.

In August 2009, we retained Perdix, Inc. in Boulder, Colorado to help us identify and build prototype products for high growth potential target markets in fiber optic telecommunications systems. During October 2009, we initiated the development and production of our prototype amplitude modulator, which can ultimately be assembled into 1- and 2-dimensional arrays that are useful for optical computing applications, such as encryption and pattern recognition. We expected our initial prototype amplitude modulator to be completed by the end of the second quarter 2010. We continued to work on this device throughout 2010 and discovered its design had limitations so we terminated the program to take a different design approach. We embarked on the new design approach in 2011 with another partner, Boulder Nonlinear Systems (BNS). A feasibility study with our new design partner was started in late 2011. This research and development program continued through 2013, and was completed the end of the third quarter of 2013. The results of this study gave us a guide on how to move forward with the design of our prototype spatial light modulator. The second phase of the program is under review and we expected to start the second phase sometime the second half of 2014; but funding for phase two of this program was delayed. We hope to reengage our work on this program after funding is approved.

In March 2010 we successfully concluded initial electrical and optical performance testing of our prototype phase modulator and began Application Engineering of our technology in customer design environments and working directly with interested large system suppliers to attempt to engineer specific individual product materials and device designs for sale to or by these suppliers. Those programs were subsequently put on hold by the system suppliers.

In October of 2010, we completed the concept stage of a novel design for an advanced optical computing application and moved forward into the design stage with Celestech, Inc. of Chantilly, Virginia. Several projects with Celestech are currently on hold. If these projects move forward, they will incorporate one or more of our Company s advanced electro-optical polymer materials.

In October of 2010 we announced the results of testing performed by Lehigh University that demonstrated the third-order non-linear properties of our proprietary molecules in the PerkinamineNR chromophore class. Lehigh University determined that the material was 100 times stronger than the highest off-resonance small molecule currently known. They also determined that it was 2,600 times more powerful than fused silica and demonstrated extremely fast (less than 1 picosecond) photo-induced non-linear response that would be capable of modulation at rates of 1 THz (terahertz). Additional testing at Lehigh University of the Company s other Perkinamine class of materials demonstrated third-order non-linear properties, which may have utility in all optical switches.

In March 2011 we entered into a research and development agreement with the City University of New York s Laboratory for Nano Micro Photonics (LaNMP) to develop third-order non-linear devices. The combination of LaNMP s device capabilities together with our materials expertise should accelerate the development of all-optical devices. This effort, starting with an all-optical switch, was continued at the University of Colorado, Boulder through an agreement entered into in January 2013. This research and development effort continued through 2014, but not at the pace we expected. In the future we hope to engage a product development partner, which should accelerate the product development program.

In March 2011, we entered into a research and development agreement with the City University of New York s (CUNY) Laboratory for Nano Micro Photonics (LaNMP) to develop third-order non-linear devices. The combination of LaNMP s device capabilities together with our materials expertise showed promise for the development of all-optical devices. The agreement ran through the end of 2011. The goal of the project was to fabricate and test slot waveguides embedded with two types of nonlinear optical polymers obtained from our Company. These two polymers were Perkinamine and PerkinamineNR . In CUNY s final report it showed they successfully demonstrated that the Perkinamine and PerkinamineNR survived their 170 degrees C processing temperature without degradation. According to their report, they were successful in one processing run wherein they showed the possibility to realize waveguides with very smooth sidewalls. Reflectivity measurements carried out under optical pumping showed phase shift in the Perkinamine material.

In March 2011 we announced a two-year research and development collaboration with the University of Alabama to explore the advanced energy capture properties of our Perkinamine class of chromophores. Our material absorbs light across a wide range of wavelengths from near infrared into the near ultraviolet. We have subsequently ended our relationship with the University.

In December 2011, we announced the discovery of a new material named Perkinamine Indigo . We believed this represented a major advancement in the field of organic nonlinear optical materials. We have much to learn about how to harness full potential of Perkinamine Indigo . The material demonstrated an unusually high electro-optical effect of greater than 250 picometers per volt at 1550 nanometers with excellent thermal and photo stability. Independent research laboratories at Micron Inc., Photon-X and The University of Colorado confirmed these characteristics. Subsequent measurements showed electro-optical effects closer to 100 picometers per volt in a 500 nm thin films. We continued the development work to better understand these results. In January 2014 we created a new methodology to combine multiple chromophores into a single polymer host that significantly improved our ability to create more powerful organic, nonlinear electro-optical polymer systems. The new synthetic chemistry process can enable multiple chromophores (dyes) to work in concert with each other within a single polymer host. This proprietary process has created two new material systems, which have demonstrated outstanding electro-optic values. In addition, initial thermal stability results exceed any commercially available organic nonlinear polymer material systems.

In June 2012 we opened a new internal research laboratory facility in Newark, Delaware in the Delaware Technology Park, near the University of Delaware. This new lab facility enables us to synthesize and test our materials in the same facility and will help us accelerate our development efforts. It is equipped with state of the art equipment necessary to expand our ability to conduct synthetic chemistry in much more tightly controlled conditions. Additionally, we equipped a separate advanced optical laboratory at the same location where the necessary testing of material candidates will be performed as they emerge from our new synthesis laboratory. The optical laboratory has subsequently been moved to Longmont, CO.

In July 2012 we entered into an agreement with The University of Colorado, Boulder, Guided Wave Optics Laboratory (GWOL) to conduct analytical testing and to carry out studies that will give a better understanding of the

properties of a new class of composite organic electro-optic materials. This class of materials was our Perkinamine Indigo . The processing and measurements were carried out primarily at the university s GWOL. The work was completed in close collaboration with Company personnel. It was determined a new synthetic chemistry and material process methodology was needed for consistent and repeatable results. That methodology was announced in January 2014.

In February 2013 we delivered to a potential large system supplier customer prototype devices that were coated with our advanced organic nonlinear electro-optical polymer, Perkinamine Indigo . Tests conducted by the University of Colorado, Boulder on coupons coated with the material demonstrated R_{33} measurements from 100-125 picometers per volt, as measured by the University of Colorado which exceeded the potential large system supplier customer's stated electro-optical requirements.

In March 2013 we entered into a product development contractor agreement with EM Photonics (EMP) of Newark, Delaware to fabricate and test waveguides and phase modulators during an initial development phase using existing EMP polymer modulator design and processes. In June 2013 we consolidated the EMP design program into our University of Colorado, Boulder (UCB) program after we fabricated structures with UCB that will be used as the basic building blocks of our Integrated Optical Device effort for the construction of both our advanced telecom modulator and data communications transceiver. In August 2013 in a combined effort of the Company s chemists, the University of Colorado, Boulder, and a third party research group, we successfully fabricated Silicon Organic Hybrid (SOH) slot waveguide modulators. The devices utilized an existing modulator structure with one of our proprietary electro-optic polymer material systems as the enabling material layer. In October 2013, we confirmed the functionality of the SOH slot waveguide modulators as operating devices.

In April 2013 our potential large system supplier customer informed us that their preliminary testing results on the prototype devices coated with Perkinamine Indigo that we delivered to them in February 2013 demonstrated several of the key performance parameters that they desired. There were additional tests that need to be completed. We worked with our potential customer utilizing our Perkinamine family of chromophores in a number of host polymers to evaluate these polymers in conjunction with our chromophores for a specific performance attributes for their application. Currently, this customer s program is on hold, and we do not know when or if this program will restart. We are currently talking to other potential new development partners.

In August 2013 in a combined effort of the Company s chemists, the University of Colorado, Boulder, and a third party research group we successfully fabricated Silicon Organic Hybrid (SOH) slot waveguide modulators. The devices utilized an existing modulator structure with one of our proprietary electro-optic polymer material systems as the enabling material layer. In October 2013, we confirmed the functionality of the SOH slot waveguide modulators as operating prototype devices. These first-generation devices have achieved greater electro-optical activity and dramatically lower drive voltage than industry standard modulators based on inorganic materials. We continued this effort in 2014 and have signed an agreement with the third party research group to continue our collaboration through 2016.

In November 2013, preliminary testing and initial data on our SOH slot waveguide modulators demonstrated several promising characteristics. The tested SOH chip had a 1-millimeter square footprint, enabling the possibility of sophisticated integrated optical circuits on a single silicon substrate. In addition, the waveguide structure was approximately 1/20 the length of a typical inorganic-based silicon photonics modulator waveguide. With the combination of our proprietary electro-optic polymer material and the extremely high optical field concentration in the slot waveguide modulator, the test modulators demonstrated less than 2.2 volts to operate. Initial speeds exceeded 30-35 GhZ in the telecom, 1550 nanometer frequency band. This is equivalent to four, 10Gb/sec, inorganic, lithium niobate modulators that would require approximately 12-16 volts to move the same amount of information. Our material also operates in the 1310 nanometer frequency band, which is suitable for data communications applications.

In January 2014 we created a new methodology to combine multiple chromophores into a single polymer host that significantly improves their ability to generate more powerful organic, nonlinear electro-optical polymer systems. The new synthetic chemistry process can enable multiple chromophores (dyes) to work in concert with each other within a single polymer host. This proprietary process has created two new material systems, which have demonstrated outstanding electro-optic values. In addition, we now have a significant amount of data on the thermal aging of our materials. We have demonstrated that our materials can withstand more than 2,000 hours at 110 degrees C with little to no change in electro-optic activity in our materials, which is a significant milestone. To our knowledge, this is something that has not been achieved before in any polymer. We are also concurrently coating prototype waveguides with our proprietary material system.

In February 2014 we received our first purchase order for our advanced organic nonlinear electro-optic polymer from Boulder Nonlinear Systems (BNS) of Boulder, Colorado in connection with the development of a next generation

LADAR system. A LADAR system is a radar system that utilizes a pulse laser to calculate the distance to a target, but is also capable of rendering a 3-D image. In the event BNS continues to move forward with the development of this LADAR system, we expect to receive additional purchase orders from BNS.

In March 2014 we began the process of manufacturing an advanced design Silicon Organic Hybrid Transceiver prototype and we released the completed chip design to the OpSIS Center at the University of Delaware who contracted with a third party to produce the initial silicon chips, which were delivered to us in December 2014 and January 2015. We are currently qualifying and testing these chips for utilization in our Silicon Organic Transceiver. The initial application will target inter-data center interconnections of more than 10 kilometers. Our next design will utilize a different frequency and address the current bottleneck in the rack-to-server layer at distances greater than 500 meters.

In April 2014 we entered into a sole worldwide license agreement with Corning Incorporated enabling us to integrate Corning's organic electro-optical chromophores into our portfolio of electro-optic polymer materials. The agreement allows us to use the licensed patents within a defined license field that includes communications, computing, power, and power storage applications utilizing the nonlinear optical properties of their materials.

In August 2014 the University of Colorado successfully fabricated and tested a bleached electro-optic waveguide modulator designed and fabricated through a sponsored collaborative research agreement. The results of this initial bleached waveguide modulator correlated well with previous electro-optic thin film properties. These initial results of our first in-house device were significant to our entire device program and were an important starting point for our current modulators that are being developed for target markets. We have multiple generations of new materials that we are optimizing for this specific design.

In October 2014 we submitted an order with Reynard Corporation to produce gold-layered fused silica substrates for our bleached waveguide modulators to be coated with several of our organic electro-optical polymers, which we received in early November 2014 and performance tested throughout December 2014. In May, 2015, we subsequently decided to eliminate this product from our commercial development plans due to its limited commercial value, low speed characteristics, difficulty to mass-produce and limited ability to integrate with existing architectures. In lieu of this development program, a commercially viable prototype ridge waveguide modulator program was started to replace the bleached waveguide development. We believe that the ridge waveguide modulator represents a viable telecom device opportunity for the Company that does not have the inherent limitations seen in bleached waveguide structures.

In May 2015 we achieved operating capability of our in-house Class 100 Clean Room where we expect to do thin film processing and complete the development of prototype photonic devices enabled by our advanced organic electro-optic polymer material systems in a timelier manner. Additionally, the Joint Institute for Laboratory Astrophysics (JILA) certified three of our employees, which allows us access to JILA s world-class semiconductor facility located at the University of Colorado, Boulder. Access to this facility provides us with better control over the quality of our development work and the speed at which it progresses.

In August 2015 we completed 2,000+ hours of thermal aging tests of several blends of materials created by our multi-chromophore process, which included lengthy exposure to high temperatures (85^0C and 110^0C). The data collected indicated minimal loss of electro-optical activity (R_{33}) of our materials, which means that our organic polymers are expected to provide decades of operational performance. These results exceed previously published efforts for other organic polymers and are an important part of our commercialization effort as we begin to implement these material systems into advanced photonic devices for the telecom and datacom markets.

Additionally, in August 2015, we completed 500+ hours of photochemical stability testing of our material candidates by exposing them to the visible light spectrum. The data collected indicated no discernible change in the chemical structures in an oxygen free environment. This stability testing was begun to help us understand more clearly the processing and manufacturing requirements of our future commercial products, and provide initial assurances to expect the same results as we move these materials into actual photonic device structures. This, in turn, has enabled us to begin initial device testing on devices that utilize our silicon photonic chips.

In October 2015, we successfully surpassed 2,000 hours of photochemical stability testing of our material candidates with little to no change in the electro-optic characteristics (R_{33}) of our material; and, in January 2016, we successfully surpassed 4,000 hours of photochemical stability testing of our material candidates with little to no change in the electro-optic characteristics (R_{33}) of our material. These photochemical stability test results, along with the thermal stability at 110°C, should enable the Company to demonstrate that organic polymers can compete head-to-head with inorganic crystalline legacy telecom and datacom devices which currently provide the backbone for the entire infrastructure that converts almost incalculable amounts of electronic (binary) data into pulses of light and back on a daily basis.

In November of 2015, we successfully fabricated ridge waveguide structures from our core material system. At the same time we successfully developed a proprietary methodology to segment individual chips from our silicon wafers that contain our ridge waveguide devices. These critical steps in our process provide us with a clear path towards a commercial telecommunication device. These same processes can be used for the fabrication of modulators to be used in data centers. The individual chips are now being analyzed and passively tested in our Longmont, CO optical test facility.

In February 2016, we successfully guided laser single-mode light through 16 of our passive ridge waveguides made entirely out of our advanced organic polymer systems, which are the building block of waveguide modulators that can achieve high modulator performance. As a result, our commercialization effort has entered the next phases of development: passive-waveguide loss measurements, followed by the development and active testing of electro-optic modulators. Utilizing continuous-wave input laser light, electro-optic modulators convert digital (binary) electrical data into output pulses of light that can be transported across fiber optic communication networks. Active testing is accomplished by applying an electrical signal to a modulator and evaluating the resulting output optical signal.

In April 2016, we successfully achieved modulation of light in our first in-house all-polymer ridge waveguide modulator prototype. This important step towards commercialization proved that our proprietary organic polymer systems could modulate light in an in-house designed and produced ridge waveguide modulator. We expect this significant achievement to eventually lead to high-speed, low input voltage modulators capable of penetrating the current market. We are still testing and modifying the poling profiles in prototype devices to duplicate the results seen in previous Teng Mann R_{33} material testing.

Presently, we are continuing to move towards completion of our operating organic polymer-enabled ridge waveguide modulator prototype using our new multi-chromophore material systems.

We ultimately intend to use our next-generation electro-optic polymer material systems and non-linear all-optical polymer material systems for future applications vital to the following industries. We expect to create specific materials for each of these applications as appropriate:

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Cloud computing and data centers

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Telecommunications/data communications

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Backplane optical interconnects

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Photovoltaic cells

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Medical applications

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Satellite reconnaissance

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Navigation systems

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Radar applications

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Optical filters

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Spatial light modulators

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All-optical switches

In an effort to maximize our future revenue stream from our electro-optic polymer material systems and non-linear all-optical polymer material systems, our business model anticipates that our revenue stream will be derived from one or some combination of the following: (i) technology licensing for specific product applications; (ii) joint venture relationships with significant industry leaders; or (iii) the production and direct sale of our own photonic device components. Our objective is to be a leading provider of proprietary technology and know-how in the photonic device markets. In order to meet this objective, subject to successful testing of our technology and having available financial resources, we intend to:

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Develop electro-optic polymer material systems and non-linear all-optical polymer material systems and photonic devices;

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Continue to develop proprietary intellectual property;

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Streamline our product development process;

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Develop a comprehensive marketing plan;

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Maintain/develop strategic relationships with government agencies, private firms, and academic institutions; and

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Continue to attract and retain high level science and technology personnel to our Company.

The Electro-Optic Device Market

General

Electro-optic devices such as fiber-optic modulators translate electric signals into optical signals. Such devices are used in communication systems to transfer data over fiber-optic networks. Optical data transfer is significantly faster and more efficient than transfer technologies using only electric signals, permitting more cost-effective use of bandwidth for broadband Internet and voice services.

Two distinct technologies currently exist for the fabrication of fiber-optic devices, such as fiber-optic modulators. The first, which is the more traditional technology, utilizes an electro-optically active inorganic core crystalline material (e.g. lithium niobate). The second, which is the focus of the Company s research and development, involves the exploitation of electro-optic polymers.

Traditional Technology - Inorganic Crystals

Traditional technology translates electric signals into optical signals generally relying upon electro-optic materials, such as lithium niobate, indium phosphide and gallium arsenide. Five of the largest inorganic fiber-optic component manufactures hold approximately 85% of the electro-optic modulator component market. They are JDSU, Sumitomo, Oclaro, Fujitsu and ThorLabs. These companies are heavily invested in the production of crystalline-based electro-optic modulator technologies, as well as the development of novel manufacturing techniques and integrated laser/modulator designs. While each company possesses their own modulator design and processing patents, the underlying core constituents (lithium niobate, indium phosphide, gallium arsenide) occur in nature and as such cannot be patented.

New Technology - Organic Polymers

Our developing technology that translates electric signals into optical signals relies upon organic electro-optic materials, such as electro-optic polymers. Electro-optic polymers involve the material integration of specifically engineered organic (carbon-based) compounds. The molecular designs of these compounds are precise and do not occur naturally; thus they may be protected under patent law.

Polymer-based electro-optic modulators may provide considerable advantages over traditional inorganic fiber-optic technology in terms of:

- Cost
- Size and versatility
- Modulating/switching speed
- Optical transmission properties
- Lower operating voltages
- Generate less heat

Our Company holds an extensive amount of internally developed intellectual property in the field of electro-optic molecular design that, as a whole, attempts to fundamentally solve these and other problems associated with these molecular structures. We believe our provisional patents describe broad, highly unique techniques for novel paradigms in molecular design.

Our innovative solution lies in a very well known scientific phenomenon called aromaticity, which causes a high degree of molecular stability. Aromaticity is a molecular arrangement wherein atoms combine into multi-membered rings and share their electrons among each other. Aromatic compounds are extremely stable because the electronic charge distributes evenly over a great area preventing hostile moieties, such as oxygen and free radicals, from finding an opening to attack. Until now, to our knowledge, no one has been able to propose molecular designs that could effectively exploit aromaticity in the design of a high-performance electro-optic polymer.

We believe now that we have fabricated electro-optic molecular architectures that do in fact exhibit extremely high thermal stability, our technologies may soon replace inorganic electro-optic materials in the marketplace due to their considerable advantages over traditional inorganic fiber-optic materials.

Our Target Markets

Our proprietary electro-optic polymers are designed at the molecular level for potentially superior performance, stability and cost-efficiency and we believe may have the potential to replace more expensive, lower-performance materials and devices used in fiber-optic ground, wireless and satellite communication networks. We believe our organic electro-optic polymers may have broad applications in civilian and military telecommunications and advanced computational systems. Potential future applications may include: (i) cloud computing and data centers; (ii) telecommunications/data communications; (iii) backplane optical interconnects; (iv) photovoltaic cells; (v) medical applications; (vi) satellite reconnaissance; (vii) navigation systems; (viii) radar applications; (ix) optical filters; (x) spatial light modulators; and (xi) all-optical switches.

Cloud computing and data centers

Big data is a general term used to describe the voluminous amount of unstructured and semi-structured data a company creates -- data that would take too much time and cost too much money to load into a relational database for analysis. Companies are looking to cloud computing in their data centers to access all the data. Inherent speed and bandwidth limits of traditional solutions and the potential of organic polymer devices offer an opportunity to increase the bandwidth, reduce costs and improve speed of access.

Telecommunications/Data Communications

Telecommunications is one of the primary initial target applications for electro-optic polymers. Telecommunication companies are currently faced with the enormous challenge to keep up with the tremendous explosion in demand for bandwidth due to the popularity of Internet enabled devices accessing all forms of streaming media, along with voice messaging, text messaging and cloud based data access.

The challenge for these companies is converting digital information in the form of electric signals into optical information and back. Their networks rely upon optical modulators based around inorganic materials, such as lithium niobate, to accomplish this task. These existing legacy modulators have inherent limitations in terms of maximum data rates, error correction, and costs associated with their manufacture and other operating costs related to drive voltage and heat dissipation due to the complexities of producing single crystalline ingots of sufficient diameter (3 to 5 inches). Also, strict environmental controls must be enforced during the growth of the core crystalline material.

Replacing these inorganic materials with organic polymer materials made with the Perkinamine family of chromophores would offer significant improvements in data rates; reduce form factor; require less error correction along with a significant reduction in drive voltage leading to less heat dissipation and hence reduce the overall cost of operation with regard to site cooling. Polymers are not inherently costly to produce nor do they require such strict environmental conditions. Due to their material flexibility (e.g. ability to more easily mold into specific topologies) they are expected to enable smaller, faster, less expensive, and more integrated network components. In many laboratory tests, electro-optic polymers have demonstrated substantial (3-10x) transmission data speed improvements over crystalline technologies (lithium niobate, gallium arsenide, indium phosphide).

Backplane Optical Interconnects

Organic nonlinear polymer based devices offer advantages in Active Optical cables that are used in data communications in computer-to-computer or server-to-server applications. It is reported that backplane optical interconnects are envisioned by members within leading corporations (including IBM, Intel and Agilent Technologies) as the future of high-speed computation. These components can potentially replace copper circuitry with photons carrying digital information over fiber optic cable in CPU architecture to manage CPU-to-graphics, CPU to-memory and CPU-to-I/O device interactions that have previously operated over an internal electrical bus. On-Chip optical buses can increase performance and decrease cost. They could speed the transmission of information within an integrated circuit, among integrated circuit chips in a module, and across circuit boards at speeds unattainable with traditional metallic interconnections and bus structures. Additionally, our organic polymer material possesses the thermal stability necessary to survive Complementary Metal Oxide Semiconductor (CMOS) processing temperatures that gives it the ability to be spin-coated directly on silicon substrates. In the future, all-optical (light-switching-light) signal processing could become possible using an advanced version of our chemistry.

Photovoltaic Cells

A solar cell (also called a photovoltaic cell) is an electrical device that converts the energy of light directly into electricity by the photovoltaic effect. It is a form of photoelectric cell (in that its electrical characteristics e.g. current, voltage, or resistance vary when light is incident upon it) which, when exposed to light, can generate and support an electric current without being attached to any external voltage source. These cells are very inefficient. Organic nonlinear polymers offer potential increases in the efficiency of photovoltaic cells that could be orders of magnitude greater than LCD technology.

Medical Applications

Medical Applications for electro-optic polymers have been proposed for many varied applications, including dentistry, oncology and protein identification. Although experimental, it is believed that the successful fabrication of high-stability electro-optic polymers could open up many future applications such as these. Other medical applications such as the higher-speed transmission of medical records, X-ray and MRI scans over the Internet would be improved by the broadening of Internet bandwidth.

Satellite Reconnaissance

Satellite reconnaissance applications include a specific target market within the Department of Defense, the 14-member Intelligence Community and their contractors. Electro-optic polymers have historically been seen as attractive for potential application in this market due to the constant need for the fastest bandwidth transmission to meet the needs of national security.

Navigation Systems

Navigation systems for both advanced aerial and missile guidance require the use of electro-optic gyroscopes. These devices are currently fabricated out of lithium niobate or similar electro-optic materials; the application of electro-optic polymers would facilitate the development of more accurate and architecturally simple device designs.

Radar Applications

Radar Applications, specifically phased array radar, has been traditionally understood as a potential application for successful electro-optic material designs, along with electronic counter measure systems (ECM) systems, ultra-fast analog-to-digital conversion, LADAR, land mine detection, radio frequency photonics and spatial light modulation.

Optical Filters

Optical filters are devices that utilize optical waveguides and various other structures like ring resonators that can be made with organic nonlinear materials that can filter out a specific wavelengths from one waveguide and redirect them to a different waveguide.

Spatial Light Modulators

Spatial Light Modulators (SLMs) are optical computing devices that can be used in various recognition applications by collecting and correlating optical input to stored images in a database using complex mathematical computations based around calculated light intensity at various point on an image. Existing Liquid Crystal display technology that is accurate, but too slow for widespread adoption has hampered proliferation of these devices.

All-Optical Switches

All-optical switches are expected to be included in the future market of all-optic devices. All-optical devices convert data in the form of input light signals to a secondary light data stream. Some experts anticipate that all-optical switches will replace traditional switches used today in microprocessors. All-optical switches are expected to enable the fabrication of an entirely new high-speed generation of polymer based computers that operate on light instead of electricity, which in turn should significantly improve computation speeds.

Our Business Strategy

The Company revised its business strategy from a materials only approach into a dual path strategy that also includes developing devices, components and potentially sub-systems. Our economic model anticipates that our revenue stream will be derived from one or some combination of the following: (i) technology licensing for specific product application; (ii) joint venture relationships with significant industry leaders; or (iii) the production and direct sale of our own electro-optic device components. Our objective is to be a leading provider of proprietary technology and know-how in the electro-optic device market. In order to meet this objective, we intend, subject to successful testing of our technology and having available financial resources, to:

- Develop electro-optic polymer material systems and non-linear all-optical polymer material systems and photonic devices;
- Continue to develop proprietary intellectual property;
- Streamline our product development process;
- Develop a comprehensive marketing plan;
- Maintain/develop strategic relationships with government agencies, private firms, and academic institutions; and
- Continue to attract and retain high level science and technology personnel to our Company.

Develop Electro-Optic Product Devices

We intend to utilize our proprietary optical polymer technology to create an initial portfolio of commercially feasible electro-optic polymer product devices and applications for various markets, including telecommunications and government. We expect our initial product device line to include high-speed 40Gb/s and 100Gb/s modulators and system applications.

Continue to Develop Proprietary Intellectual Property

We plan to advance our core competence in electro-optic polymer technology by continuing to develop proprietary materials, processes, designs and devices. We also plan to protect our technology by filing patent applications where appropriate, obtaining exclusive technology rights where available, and taking other appropriate steps to secure and protect our intellectual property.

Streamline Our Product Development Process

We intend to streamline our development process and to design, fabricate and test proprietary materials and potential electro-optic polymer devices in order to position our Company to take advantage of emerging market opportunities.

In 2011 we retained the services of EOvation Advisors LLC, a technology and business advisory firm founded by Dr. Frederick Leonberger, former chief technology officer at JDS Uniphase Corporation, a leading provider of communications test and measurement solutions, and optical products. Dr. Leonberger is presently a senior advisor to the Company and its Board of Directors in assisting our Company with strategic planning and the design of optical modulators that we intend to develop.

Develop a Comprehensive Marketing Plan

We are developing sales and marketing plans for our devices for implementation once we produce multiple prototype devices for the optical market. We plan to aggressively pursue sales of our potential products through the use of industry-specific sales organizations, such as electro-optic component representatives and distributors. In addition, we plan to target market leaders as initial customers and to leverage relationships with these market leaders to obtain future contracts and sales references.

Maintain/Develop Strategic Relationships with Government Agencies, Private Firms, and Academic Institutions

Since the formation of our Company, we have had numerous strategic relationships with government agencies that have provided us with funding and access to important technology. We intend to establish, re-establish or maintain our relationships with:

1. DARPA, the Defense Advance Research Project Agency by sharing the technical data and test results on our aromatic molecular materials.
2. Strategic partners ranging from micro-electronic component firms to large-scale computer companies. We believe strategic alliances and/or technology licensing will be a crucial step in commercializing our novel technologies and achieving competitive advantages.
3. The National Science Foundation, an independent federal agency created by Congress to promote the progress of science; to advance the national health, prosperity, welfare and to secure the national defense through advanced and promising new technologies.

Continue to attract and retain high-level science and technology personnel to our Company

In May 2007, we retained Dr. David F. Eaton as our Interim Chief Technology Officer and in January 2008, Dr. Eaton became our permanent Chief Technology Officer until his resignation as such in November 2011. Dr. Eaton now serves as our scientific advisor, a non-executive position. Previously, Dr. Eaton spent thirty years with DuPont where he worked in research & development, research & development management and business leadership positions. Dr. Eaton spearheaded DuPont s entry into polymer-based components for fiber optic telecommunication by founding DuPont Photonics Technology, a wholly owned subsidiary of DuPont.

In March 2008, we retained Terry Turpin as our Optical Computing expert. Mr. Turpin began his engineering career developing computing engines for the National Security Agency (NSA) where he served as Chief of the Advanced Processing Technologies Division, representing the NSA on the Tri-Service Optical Processing Committee organized by the Under Secretary of Defense for Research and Engineering.

In November 2008, we retained Howard E. Simmons, III, PhD to our technology team. Dr. Simmons is a graduate of MIT and Harvard, who spent 25 years with DuPont engaged in research & development at the corporate and business unit level. Mr. Simmons has contributed to programs in organic light emitting diodes (OLEDS), printable electronics, graphic arts, optical recording materials and fundamental polymer research and holds 26 patents.

In February 2009, we retained Anthony J. Cocuzza, PhD to our technology team. Dr. Cocuzza worked for 30 years in medicinal chemistry and brings a highly developed set of synthetic and analytical skills to our Company. A graduate of Princeton, Dr. Cocuzza spent 24 years with DuPont engaged in corporate research & development and with DuPont s joint venture with Merck.

In November 2011 we retained Louis C. Glasgow, PhD as our Chief Technology Officer. For seven years Dr. Glasgow worked at Corning, Inc. as the Director of Organic Technology. Prior to that, Dr. Glasgow spent 28 years working at DuPont in various capacities, his last being Director of Innovation. In May 2013 Dr. Glasgow resigned as Chief Technology Officer and now serves as Senior Technical Advisor to the Company, a non-executive position.

In December 2011, we retained Dr. Frederick Leonberger, PhD as our Senior Advisor. Dr Leonberger is the former Chief Technology Officer of JDS Uniphase, Inc. We previously retained EOvation Advisors LLC, a technology and business advisory firm founded by Dr. Frederick Leonberger, as a consultant to the Company. Dr. Leonberger is presently assisting our Company with strategic planning and the design of optical modulators that we intend to develop. Starting January 2013, Dr. Leonberger also serves as an advisor to our Board of Directors.

In February 2014 we retained Ashok Shenvi, PhD as part of our technology team as Senior Principal Investigator. Dr. Shenvi received his Ph.D. from Stanford University and a M.Sc. from the Indian Institute of Technology in Bombay, India. Dr. Shenvi has over 30 years of experience working in medicinal and organic chemistry at Astra Zeneca Pharmaceuticals and central research at E. I. DuPont Company. Dr. Shenvi has authored 37 scientific publications and presentations, and has been granted 20 patents.

Our Research and Development Process

Our research and development process consists of the following steps:

- We develop novel polymer materials utilizing our patented and patent pending technology to meet certain performance specifications. We then develop methods to synthesize larger quantities of such material.
- We conduct a full battery of tests at the completion of the synthesis of each new polymer material to evaluate its characteristics. We also create development strategies to optimize materials to meet specifications for specific applications.
- We integrate data from the material characterization and test results to fabricate devices. We analyze device-testing results to refine and improve fabrication processes and methods. In addition, we investigate alternative material and design variations to possibly create more efficient fabrication processes.
- We create an initial device design using simulation software. Following device fabrication, we run a series of optical and electronic tests on the device.

We have and expect to continue to make significant operating and capital expenditures for research and development. Our research and development expenses were $2,825,099 and $2,849,620 for the years ended December 31, 2015 and 2014, respectively.

Our Proprietary Products in Development

As part of a two-pronged marketing strategy, our Company is developing several optical devices, which are in various stages of development and that utilize our organic nonlinear optical materials. They include:

Ridge Waveguide Modulator

Our ridge electro-optic waveguide modulator was designed and fabricated in our Longmont, Colorado lab. The fabrication of our first in-house device is significant to our entire device program and is an important starting point for modulators that are being developed for target markets. We have multiple generations of new materials that we will soon be optimizing for this specific design. The ridge waveguide modulator represents our first commercially viable device, and targets metro networks (< 10Km) within large scale telecommunications and data communications networks and represents approximately a $300MM per year market opportunity for us.

Slot Waveguide Modulator

Our functional Silicon Organic Hybrid (SOH) slot waveguide modulator utilizes an existing modulator structure with one of our proprietary electro-optic polymer material systems as the enabling material layer, and is functional as an operating prototype device. Preliminary testing and initial data on our SOH slot waveguide modulators demonstrated several promising characteristics. The tested SOH chip had a 1-millimeter square footprint, enabling the possibility of sophisticated integrated optical circuits on a single silicon substrate. In addition, the waveguide structure was approximately 1/20 the length of a typical inorganic-based silicon photonics modulator waveguide. With the combination of our proprietary electro-optic polymer material and the extremely high optical field concentration in the slot waveguide modulator, the test modulators demonstrated less than 2.2 volts to operate. Initial speeds exceeded 30-35 GhZ in the telecom, 1550 nanometer frequency band. This is equivalent to four, 10Gb/sec, inorganic, lithium niobate modulators that would require approximately 12-16 volts to move the same amount of information. Our material also operates in the 1310 nanometer frequency band, which is suitable for data communications applications. We continued with our collaborative development of our SOH slot waveguide modulator in 2014 and have signed an agreement with the associated third party research group to continue our collaboration through 2016.

Spatial Light Modulator

We have a development program to develop a Spatial Light Modulator with an outside manufacturer, Boulder Nonlinear Systems (BNS) utilizing certain Perkinamine chromophores. A spatial modulator is a form of optical computer that can perform various advanced tasks, such as object and facial recognition, by using advanced mathematical calculations known as Fourier Transforms. Our organic nonlinear optical materials can potentially produce update rates of more than a million times per second, which is a significant improvement in processing speed over existing Liquid Crystal Display technology that updates at only 30 to 60 times per second.

100 Gbps Telecommunications Modulator

We have recently begun a second-generation design of a unique telecommunications modulator incorporating our newly developed materials in the Perkinamine family. We anticipate this modulator will be able to exceed the performance of existing legacy modulators by an order of magnitude, and will allow for improvements in the form of reduced power consumption and reduced device cost.

200 Gbps Datacomm/Telecomm Photonic Transceiver

We propose to develop multichannel integrated nanophotonic transceivers for application in data communications. The transceiver consists of a silicon photonic chip fabricated with nonlinear polymer infused modulators (SOH), multiplexers, demultiplexers, detectors and grating fiber couplers to an external light source. The CMOS-compatible optical modulators are key components for future silicon-based photonic transceivers. Our solution, the silicon-organic hybrid (SOH) platform has been proposed and is being prototyped. In the SOH approach, the optical signal is guided by a silicon waveguide while an organic cladding provides the electro-optic effect.

Other Potential Applications For Our Products

Optical Filters

We are in preliminary design and fabrication phases of development of an optical filter using our proprietary Perkinamine and PerkinamineNR materials within a SiNx photonics platform. Initial work has been done in collaboration with City University of New York, but limitations in their process capabilities have led us to seek alternate fabrication facilities, which are underway at this time.

All-Optical Switches

An all-optical switch is one that enables signals in optical fibers or networks to be selectively switched from one fiber or circuit to another. Many device designs have been developed and commercialized in today s telecom networks to effect optical switching by using mechanical or electrical control elements to accomplish the switching event. Future networks will require all-optical switches that can be more rapidly activated with a low energy and short duration

optical (light) control pulse.

Multi-Channel Optical Modem

The availability of low cost electro-optic modulators will enable low cost multichannel optical modems that will use many wavelengths in parallel and employ high efficiency modulation techniques such as QAM (quadrature amplitude modulation). Such modems would enable an order of magnitude increase in the Internet capacity of legacy fiber. Lightwave Logic is in the early feasibility stage of such a multichannel optical modem.

Our Current Strategic Partners

Boulder Non-Linear Systems

Boulder Nonlinear Systems, Inc. is a Colorado company that designs, manufactures and sells liquid crystal based photonics devices and systems. BNS builds unique analog liquid crystal on silicon modulators used in applications ranging from holographic storage to microscopic cell manipulation. Its advanced liquid crystal technology is used in telecommunications, medical instruments, defense, and manufacturing.

Our Past Government Program Participation

Our Company has been a participant in several vital government sponsored research and development programs with various government agencies that protect the interests of our country. The following is a list of some of the various divisions of government agencies that have provided us with advisory, financial and/or materials support in the pursuit of high-speed electro-optic materials. We are not partnered with, strategically related to, or financially supported by any governmental agency at this time. Our previous relationships included:

- National Reconnaissance Office (NRO)
- Properties Branch of the Army Research Laboratory on the Aberdeen Proving Grounds in Aberdeen, Maryland.
- Defense Advance Research Project Agency (DARPA)
- Naval Air Warfare Center Weapons Division in China Lake, California
- Air Force Research Laboratory at Wright-Patterson Air Force Base in Dayton, Ohio

Our Competition

The markets we are targeting for our electro-optic polymer technology are intensely competitive. Among the largest fiber-optic component manufactures are Finisar, JDSU, Oclaro, NeoPhotonics, OpLink, CyOptics. Additionally, the five largest inorganic modulator component manufacturers hold approximately 85% of the electro-optic modulator component market. They are JDSU, Sumitomo, Oclaro, Fujitsu and ThorLabs. These companies are heavily invested in the production of crystalline-based electro-optic modulator technologies, as well as the development of novel manufacturing techniques and modulator designs.

We considered GigOptix, Inc., as our primary polymer competitor. They designed and patented potentially commercially feasible electro-optic polymers and hold an exclusive license to all electro-optic polymeric technology developed at the University of Washington. GigOptix presently has a joint venture with CPqD. Subsequently, GigOptix sold a majority interest of their polymer IP to BrPhotonics based in Brazil.

We believe that through the commercialization of our technology, we will be poised to obtain a significant portion of the component manufacturing market. Electro-optic polymers demonstrate several advantages over other technologies, such as inorganic-based technologies, due to their reduced manufacturing and processing costs, higher performance and lower power requirements. Our patented organic polymers and future electro-optic devices have demonstrated significant stability advantages over our known competitor's materials.

We believe the principal competitive factors in our target markets are:

- The ability to develop and commercialize highly stable optical polymer-based materials and optical devices, including obtaining appropriate patent and proprietary rights protection.
- Lower cost, high production yield for these products.
- The ability to enable integration and implement advanced technologies.
- Strong sales and marketing, and distribution channels for access to products.

We believe that our current business planning will position our Company to compete adequately with respect to these factors. Our future success is difficult to predict because we are an early stage company with all of our potential products still in development.

Many of our existing and potential competitors have substantially greater research and product development capabilities and financial, scientific, marketing and human resources than we do. As a result, these competitors may:

- Succeed in developing products that are equal to or superior to our potential products or that achieve greater market acceptance than our potential products.
- Devote greater resources to developing, marketing or selling their products.
- Respond quickly to new or emerging technologies or scientific advances and changes in customer requirements, which could render our technologies or potential products obsolete.
- Introduce products that make the continued development of our potential products uneconomical.
- Obtain patents that block or otherwise inhibit our ability to develop and commercialize our potential products.
- Withstand price competition more successfully than we can.
- Establish cooperative relationships among themselves or with third parties that enhance their ability to address the needs of our prospective customers.
- Take advantage of acquisition or other opportunities more readily than we can.

Our Laboratory Facilities

In June 2012 we opened an internal research laboratory facility in Newark, Delaware in the Delaware Technology Park, near the University of Delaware. This lab facility enables us to synthesize and test our materials in the same facility and to accelerate our development efforts. It is equipped with state of the art equipment necessary to conduct synthetic chemistry in much more tightly controlled conditions.

In January of 2014 we moved our Corporate Headquarters, as well as our advanced optical laboratory at the same location where the necessary testing of material candidates will be performed as they emerge from our synthesis laboratory. We commenced construction of clean room at this facility during the fourth quarter of 2014, which became fully operational and functional in April 2015. This clean room enables us to expand our in-house prototype development capabilities.

Employees

We currently have 9 full-time employees and 7 part-time employees, and we retain several independent contractors on an as-needed basis. We believe that we have good relations with our employees.

Properties

Our executive and business office headquarters are located at 1831 Lefthand Circle, Suite C, Longmont, CO 80501. We coordinate our operations, optical device design, optical laboratory, thin films laboratory and clean room, and market our services from this space. Our annual base rent for this space is $47,578.

We also lease approximately 2,000 square feet of laboratory space at 1 Innovation Way, Newark, Delaware 19711, which we utilize to operate an organic synthesis and thin-films laboratory. Our annual rent for this space is approximately $71,662. We vacated our 1,400 square feet of laboratory space at 41A Germay Drive, Wilmington, Delaware during 2015.

Legal Proceedings

We are not currently a party to or engaged in any material legal proceedings and we are not aware of any litigation or threatened litigation of a material nature. However, we may be subject to various claims and legal actions arising in the ordinary course of business from time to time.

MANAGEMENT

The following table sets forth, as of the date of this prospectus, the name, age, position and term/period served of each person who serves as an executive officer, director and significant employee of our Company. There are no family relationships among any of our executive officers, directors and significant employees.

Name	Age	Position
Thomas E. Zelibor	62	Chair of the Board of Directors; Chief Executive Officer
James S. Marcelli	68	Director; President; Chief Operating Officer
Andrew J. Ashton	42	Director; Senior Vice President; Secretary
Terry Turpin	73	Optical Computing Expert(1)
William C. Pickett, III	72	Director
Joseph A. Miller	74	Director
Ronald A. Bucchi	61	Director
Siraj Nour El-Ahmadi	51	Director
George L. Lauro	57	Director
Michael S. Lebby	54	Director

(1) Our Optical Computing and signal processing expert is not an executive officer position, but our Company anticipates that Mr. Turpin s expertise in optical computing and his respect in the optical computing community will significantly contribute to the development of our Company.

Business experience of directors, executive officers, and significant employees

Thomas E. Zelibor, Rear Admiral, USN (Ret). RADM Zelibor has served as our Chief Executive Officer and Chair of the Board of Directors (executive) since May 2012. RADM Zelibor previously served as Non-Executive Chair of the Board of Directors of our Company since October 2011, and has served as a director of our Company since July 2008. He also previously served on our Operation Committee. RADM Zelibor is in charge of the overall general management of the Company and supervision of Company policies, setting the Company s strategies, formulating and overseeing the Company s business plan, raising capital, expanding the Company s management team and the general promotion of the Company. RADM Zelibor has over twenty years of strategic planning and senior leadership experience. Since April 2011 Mr. Zelibor served as the Chief Executive Officer and President of Zelibor & Associates, LLC, a management-consulting firm. From July 2008 to April 2011, Mr. Zelibor served as the Chief Executive Officer and President of Flatirons Solutions Corp., a professional services firm that provides consulting, systems integration, systems & software engineering, and program management expertise to corporate and government clients. Prior to that time, RADM Zelibor served in the U.S. Navy in a number of positions, including as the Dean of the College of Operational and Strategic Leadership at the United States Naval War College where he was

responsible for the adoption of a corporate approach to leadership development; Director of Global Operations, United States Strategic Command; Director, Space, Information Warfare, Command and Control on the Navy staff; Department of the Navy, Deputy Chief Information Officer (CIO), Navy; Commander, Carrier Group Three and Commander, Naval Space Command.

Mr. James S. Marcelli. Mr. Marcelli has served as an officer and director of our Company since August 2008. Since May 2012 Mr. Marcelli has served as our Company s President and Chief Operating Officer. Previously, from August 2008 to April 2012, Mr. Marcelli served as our President and Chief Executive Officer. Mr. Marcelli is in charge of the day-to-day operations of our Company and its movement to a fully functioning commercial corporation, and also serves as our Company s principal financial officer. Since 2000, Mr. Marcelli has served as the president and chief executive officer of Marcelli Associates, a consulting company that offers senior management consulting, mentoring, and business development services to start-up and growth companies. Business segments Mr. Marcelli has worked with included an Internet networking gaming center, high-speed custom gaming computers, high tech manufacturing businesses and business service companies.

Mr. Andrew J. Ashton. Mr. Ashton has served as an officer and director of our Company since July 2004. Mr. Ashton has served as our Senior Vice president since April 2009. Since 2004, his assistance in the creation of the synthetic chemistry of our novel molecular architecture has been fundamental to our Company's success. His current duties include the development of chemical synthesis, providing extensive analytical support and assisting with our Company's management goals. Mr. Ashton is a skilled computer scientist and organic chemist who began his career in 1998 at the Army Research Laboratory on the Aberdeen Proving Grounds where he helped to design and implement computer interfaces for fiberglass composite analysis.

Mr. Terry Turpin. Mr. Turpin has served as our Optical Computing Expert since March 2008. Since October 2006, Mr. Turpin has been a member of the UMBC College of Natural Science and Mathematics Advisory Board. Until January 2007, when Northrop Grumman Space & Mission Systems Corp. acquired Essex Corporation, Mr. Turpin was a director of Essex Corporation. Mr. Turpin remained Senior Vice President and Chief Scientist for Essex Corporation after its acquisition until April 2007. Mr. Turpin was appointed as a director of Essex Corporation in January 1997 and became its Senior Vice President and Chief Scientist in 1996. He joined Essex Corporation through a merger with SEDC where he was Vice President and Chief Scientist from September 1984 through June 1989. From December 1983 to September 1984 he was an independent consultant. From 1963 through December 1983, the National Securities Agency (NSA) employed Mr. Turpin. He was Chief of the Advanced Processing Technologies Division for ten years. He holds patents for optical computers and adaptive optical components. Mr. Turpin represented NSA on the Tri-Service Optical Processing Committee organized by the Under Secretary of Defense for Research and Engineering. He received a Bachelor of Science degree in Electrical Engineering from the University of Akron in 1966 and a Master of Science degree in Electrical Engineering from Catholic University in Washington, D.C. in 1970.

Mr. William C. Pickett. Mr. Pickett has served as a director of our Company since January 2008. Mr. Pickett enjoyed a 32 year career with E.I. DuPont de Nemours & Co., where he worked in numerous financial leadership positions, including serving from February 2002 to April 2004 as Chief Financial Officer of Invista, DuPont s $7 billion man-made fibers company, which was ultimately sold to Koch Industries, Inc. From 2005 through 2011, Mr. Pickett served on the Board of Directors of the Ronald McDonald House of Delaware. He also served as Treasurer, was a member of the Executive Committee, and chaired the Finance Committee. From 2004 through 2015, Mr. Pickett served on the Board of Trustees of Operation Warm, a not-for-profit organization, and chaired their Audit Committee. Mr. Pickett received his MBA from the Harvard Business School and a BA from Trinity College.

Dr. Joseph A. Miller, Jr. Dr. Miller has served as a director of our Company since May 10, 2011. From 2002 to May 2012, Dr. Miller served as Executive Vice President and Chief Technology Officer of Corning Incorporated, having joined Corning Incorporated in 2001 as Senior Vice President and Chief Technology Officer. Prior to joining Corning Incorporated, Dr. Miller was with E.I. DuPont de Nemours, Inc., where he served as Chief Technology Officer and Senior Vice President for Research and Development since 1994. Dr. Miller began his career with DuPont in 1966. Dr. Miller is a director and Non-executive Chairman of Nuvectra Corp. He holds a doctorate degree in Chemistry from Penn State University.

Mr. Ronald A. Bucchi. Mr. Bucchi has served as a director of our Company since June 11, 2012. Mr. Bucchi is currently a self employed C.P.A. with a specialized practice that concentrates in CEO consulting, strategic planning, mergers, acquisitions, business sales and tax. He works with domestic and international companies. Mr. Bucchi is currently a member of the board of directors of First Connecticut Bancorp, Inc. (Farmington Bank) (FBNK:NASDAQ GM), serving on Asset Liability Committee, the Governance and Loan committees in addition to chairing the Audit committee. He is currently the Treasurer and a member of the Board of Directors of the Petit Family Foundation, Inc. He has served on numerous other community boards and is past Chairman of the Wheeler Clinic and the Wheeler YMCA. He is a member of the Connecticut Society of Certified Public Accountants, American Institute of Certified Public Accountants and the National Association of Corporate Directors. Mr. Bucchi is a graduate of the Harvard

Business School Executive Education program with completed course studies in general board governance, audit and compensation and a graduate of Central Connecticut State University where he received his B.S. in Accounting.

Mr. Siraj Nour El-Ahmadi. Mr. El-Ahmadi has served as a director of our Company since October 2, 2013. Since 2004, Mr. El-Ahmadi has served as Founder, President and Chief Executive Officer of Menara Networks, a developer of innovative products and solutions that simplify layered optical transport networks. Mr. El-Ahmadi has over 17 years of experience in optical transmission in particular and the telecom industry in general. Prior to founding Menara, Mr. El-Ahmadi served as Vice President-Marketing & Product Management at Nortel where he was responsible for the OPTera LH 4000 ULR product (acquired from Qtera) that achieved over $200M in revenues in its first two years. Prior to that, Mr. El-Ahmadi was the Product Architect & Vice President of Product Management at Qtera Corporation, a successful technology start-up acquired by Nortel in 2000 for $3.25 billion. Mr. El-Ahmadi also held a Senior Manager position at Bell Northern Research and worked as a Transmission Engineer at WilTel (WorldCom) where he evaluated and deployed the world first bidirectional EDFA and bi-directional WDM transmission. Mr. El-Ahmadi holds a BS and MS in Electrical Engineering from the University of Oklahoma, is a member of Eta Kappa Nu and is the inventor of 11 patents, issued or pending, in the area of optical communications. He has authored a number of publications and is a frequent speaker at telecom and optical networking events and conferences.

Mr. George L. Lauro. Mr. Lauro has served as a director of our Company since May 12, 2014. Since 2009, Mr. Lauro has served as Founder/Partner of Alteon Capital Partners, a Venture Capital Advisory firm. Mr. Lauro has 25 years of experience as a technology entrepreneur, operating executive and venture capitalist. He was a Managing Director at Wasserstein Perella, and head of West Coast technology investing. He has led and syndicated 18 private equity financing rounds and control deals, raising over $100M equity financing for portfolio companies and completed over $1 billion in M&A transactions. Mr. Lauro began his career in the hi-tech industry holding positions primarily focused on the commercialization of emerging technologies. He served as the Director of Technology Commercialization at IBM where he was responsible for transitioning technologies from research labs to the market. Also, he was the Director of New Business Development for Motorola. Mr. Lauro has previously served on numerous corporate boards of both public and private technology companies. Mr. Lauro holds a B.S. in Electrical Engineering from Brown University, a MBA from Wharton School University of Pennsylvania, and he participated in aeronautical engineering graduate studies at MIT.

Dr. Michael S. Lebby. Dr. Lebby has served as a director of our Company since August 26, 2016. From June 2013 to present, Dr. Lebby served as President and CEO of OneChip Photonics, Inc., a privately held company headquartered in Ottawa, Canada, that is a leading provider of low-cost, small-footprint, high-performance indium phosphide (InP)-based photonic integrated circuits (PICs) and PIC-based optical sub-assemblies (OSAs) for the Data Center markets. Also, Dr. Lebby presently serves as part-time full professor, and chair of optoelectronics at Glyndwr University in Wales, UK, and as a consultant to bring forward advanced materials, device, and integrated photonics technologies that will generate high margin value as products. Since 2015, Dr. Lebby has been focusing on InP-based photonic integrated circuits (PICs) and optoelectronic integrated circuits (OEICs) for the datacenter segment and has been instrumental in assembling California s proposal (via USC) to the Federal Government for an integrated photonics manufacturing institute. Dr. Lebby holds a Doctor of Engineering, a Ph.D., a MBA and a Bachelors degree, all from the University of Bradford, United Kingdom.

The Board of Directors believes that each of the Directors named above has the necessary qualifications to be a member of the board of directors. Each Director has exhibited during his prior service as a director the ability to operate cohesively with the other members of the board of directors. Moreover, the Board of Directors believes that each director brings a strong background and skill set to the Board of Directors, giving the Board of Directors as a whole competence and experience in diverse areas, including corporate governance and board service, finance, management and industry experience.

Our bylaws provide that the number of directors who constitute our Board of Directors is determined by resolution of the Board of Directors, but the total number of directors constituting the entire Board of Directors shall not be less than three or more than nine. Our Board of Directors currently consists of nine directors. On July 25, 2013, certain provisions of our bylaws were amended, including provisions relating to: (i) Classes of Directors, whereby the Board of Directors is divided into three classes, as nearly equal in number as possible, designated: Class I, Class II and Class III. Prior to the amendment, there was only one class of directors; and (ii) Terms of Office, whereby provisions were created for staggered terms with each director serving for a term ending on the date of the third annual meeting following the annual meeting at which such director was elected; provided, that each director initially appointed to Class I shall serve for an initial term expiring at the first annual meeting of shareholders following the effectiveness of

this provision; each director initially appointed to Class II shall serve for an initial term expiring at the second annual meeting of shareholders following the effectiveness of this provision; and each director initially appointed to Class III shall serve for an initial term expiring at the third annual meeting of shareholders following the effectiveness of this provision; provided further, that the term of each director shall continue until the election and qualification of a successor and be subject to such director's earlier death, resignation or removal. Prior to the amendment, there were no staggered terms and each director served for a term of one (1) year.

Each Director of the Company holds such position until the next annual meeting of shareholders and until his successor is duly elected and qualified. The officers hold office until the first meeting of the board of directors following the annual meeting of shareholders and until their successors are chosen and qualified, subject to early removal by the board of directors.

Section 16(a) Beneficial Ownership Reporting Compliance

Section 16(a) of the Securities Exchange Act of 1934, as amended (the Exchange Act), requires that our executive officers and directors, and persons who own more than ten percent of a registered class of our equity securities, file reports of ownership and changes in ownership with the SEC. Executive officers, directors and greater-than-ten percent stockholders are required by SEC regulations to furnish us with all Section 16(a) forms they file. To the best of our knowledge, based solely upon a review of Forms 3 and 4 and amendments thereto furnished to our Company during its most recent fiscal year and Forms 5 and amendments thereto furnished to our Company with respect to its most recent fiscal year, and any written representation referred to in paragraph (b)(1) of Item 405 of Regulation S-K, all of our executive officers, directors and greater-than-ten percent stockholders complied with all Section 16(a) filing requirements with the following exception: Mr. George Lauro filed one late Form 4 to report shares he acquired directly from the Company in connection with his Operations Committee work.

Code of Ethics

Our Company has adopted a Code of Ethics and Business Conduct that applies to all of the Company s employees, including its principal executive officer and principal accounting officer. A copy of our Code of Ethics is available for review on the Investors page of our Company s website www.lightwavelogic.com. The Company intends to disclose any changes in or waivers from its Code of Ethics by posting such information on its website.

Nominating Committee

Our Board of Directors does not have a nominating committee. This is due to our being a development stage company. Instead of having such a committee, our Board of Directors historically has searched for and evaluated qualified individuals to become nominees for membership on our Board of Directors. The directors recommend candidates for nomination for election or reelection for each annual meeting of shareholders and, as necessary, to fill vacancies and newly created directorships. No material changes to the procedures by which our shareholders may recommend nominees to our Board of Directors has occurred since we last provided disclosure regarding these procedures in our Definitive Schedule 14A filed on April 20, 2016.

Audit Committee

Our Company has in place a separately designated standing audit committee in accordance with Section 3(a)(58)(A) of the Exchange Act. Our audit committee is governed by an audit committee charter, a current copy of which is available to security holders on our web site located at www.lightwavelogic.com.

Our audit committee has reviewed and discussed the audited financial statements with management and has discussed with its independent auditors the matters required to be discussed by the statement on Auditing Standards No. 61, as amended (AICPA, Professional Standards, Vol. 1, AU section 380) as adopted by the Public Company Accounting Oversight Board in Rule 3200T. The audit committee has received the written disclosures and the letter from its independent accountant required by applicable requirements of the Public Company Accounting Oversight Board regarding the independent accountant s communications with the audit committee concerning independence, and has discussed with its independent accountant its independent accountant s independence. Based on the review and discussions described above, the audit committee recommended that the audited financial statements be included in our Annual Report on Form 10-K for the last fiscal year for filing with the Securities and Exchange Commission.

Our audit committee is comprised of Ronald A. Bucchi, William C. Pickett, III and George L. Lauro. Mr. Bucchi serves as our audit committee financial expert as that term is defined by the rules promulgated by the Securities and Exchange Commission. Mr. Bucchi is an independent director, as defined below in Certain Relationships and Related Transactions, and Director Independence.

Risk Oversight

The Board of Directors is actively involved in the oversight of risks, including strategic, operational and other risks, which could affect our business. The Board of Directors does not have a standing risk management committee, but administers this oversight function directly through the Board of Directors as a whole, which oversee risks relevant to their respective functions. The Board of Directors considers strategic risks and opportunities and administers its respective risk oversight function by evaluating management s monitoring, assessment and management of risks, including steps taken to limit our exposure to known risks, through regular interaction with our senior management and in board and committee deliberations that are closed to members of management. The interaction with management occurs not only at formal board and committee meetings but also through periodic and other written and oral communications.

Meetings of the Board and Committees

During 2015, there were five meetings of the Board of Directors. Each current director attended at least 75% of the total number of meetings of the board held in 2015. The Board of Directors also acted at times by unanimous written consent, as authorized by our bylaws and the Nevada Revised Statutes.

EXECUTIVE COMPENSATION

The table below summarizes all compensation awarded to, earned by, or paid to our named executive officers for the fiscal years ended December 31, 2015 and 2014.

Summary Compensation Table

Name and Principal Position	Year	Salary	Bonus	Stock Awards	Option Awards	All Other Compensation	Total
		($)	($)	($)	($)	($)	($)
(a)	(b)	(c)	(d)	(e)	(f)	(i)	(j)
Thomas E. Zelibor	2015	352,440	0	0	188,402	0	540,842
CEO, Chmn. of the Board (1)	2014	301,834	0	0	78,979	0	380,813
James S. Marcelli	2015	221,317	0	0	522,716	0	744,033
President, COO, Director (2)	2014	217,160	0	0	20,425	0	237,585

1.

Pursuant to an employment agreement, effective May 1, 2012, Mr. Zelibor received an option to purchase up to 500,000 shares of common stock at an exercise price of $1.30 per share. The options vest quarterly over one year in equal installments of 125,000 shares per quarter beginning May 1, 2012. The employment agreement was amended on August 29, 2013, and effective September 1, 2013, his receives a salary of $18,750 per month. Pursuant to a new employment agreement dated March 3, 2014, Mr. Zelibor receives a salary of $25,000 per month effective January 1, 2014, a salary of $29,166.66 per month effective January 1, 2015 and an option to purchase up to 40,000 shares of common stock at an exercise price of $0.92 per share. The options vest quarterly over one year in equal installments of 10,000 beginning April 1, 2014. On July 11, 2008, Mr. Zelibor was awarded an option to purchase up to 100,000 shares of common stock at an exercise price of $1.75 per share. The option vests 25,000 shares immediately and the remaining annually over three years in equal annual installments of 25,000 shares per year beginning July 11, 2009. On November 9, 2012 the options were extended to July 10, 2015. On August 29, 2008, Mr. Zelibor was awarded an option to purchase up to 150,000 shares of common stock at an exercise price of $1.42 per share. The option vests 37,500 shares immediately and the remaining annually over three years in equal annual installments of 37,500 shares per year beginning August 29, 2009. On November 9, 2012 the options were extended to August 28, 2015. On December 13, 2010, Mr. Zelibor was awarded an option to purchase up to 100,000 shares of common stock at an exercise price of $1.00 per share. The option vests 25,000 shares immediately and the remaining annually over three years in equal annual installments of 25,000 shares per year beginning November 4, 2011. On December 19, 2011,

Mr. Zelibor was awarded an option to purchase up to 250,000 shares of common stock at an exercise price of $1.01 per share. The option vests 62,500 shares immediately and the remaining annually over three years in equal annual installments of 62,500 shares per year beginning December 19, 2011. On July 1, 2015, the options issued July 11, 2008, August 29, 2008 and December 2010 totaling 350,000 shares were cancelled, and on that same date, Mr. Zelibor was granted an option to purchase up to 350,000 shares of Company stock at an exercise price of $0.70 per share that vested immediately. On November 10, 2015, Mr. Zelibor was granted an option to purchase up to 100,000 shares of Company stock at an exercise price of $0.86 per share. The option vests 12,500 shares on January 1, 2016 and the remaining vest quarterly in equal installments of 12,500 shares beginning April 1, 2016. The compensation includes the amount for services rendered to the Company in his capacity as both an officer and a director.

2.

Effective August 1, 2013, Mr. Marcelli receives a salary of $17,917 per month and an option to purchase up to 100,000 shares of common stock at an exercise price of $1.00 per share. The options vest in equal installments of 25,000 options with the first installment vesting on August 1, 2013 and the remaining installments vesting quarterly commencing on October 1, 2013. Pursuant to previous employment agreements, Mr. Marcelli received, among other things, (i) an option to purchase up to 100,000 shares of common stock at an exercise price of $1.50 per share. The options vest quarterly over two years in equal installments of 12,500 shares per quarter beginning August 1, 2010; and (ii) an option to purchase up to 1,050,000 shares of common stock at an exercise price of $1.75 per share. The options vest quarterly over three years in equal installments of 87,500 shares per quarter beginning November 1, 2008. On November 9, 2012 the options were extended to July 31, 2015. Additionally, in the event Mr. Marcelli s employment terminates upon his death and the key man life insurance is in place for Mr. Marcelli, our Company will continue to pay the base cash compensation described in Mr. Marcelli s employment agreement to his estate through the remainder of term of his employment agreement, or 90 days, whichever is longer. On July 1, 2015, the options issued August 1, 2010 and August 1, 2013 totaling 1,150,000 shares were cancelled, and on that same date, Mr. Marcelli received an option to purchase up to1,150,000 shares of Company stock at an exercise price of $0.70 that vested immediately. Pursuant to an employment agreement amendment, effective August 1, 2015, Mr. Marcelli receives a salary of $18,750 per month and an option to purchase 50,000 shares of common stock. The options vest 12,500 immediately and the remainder in equal quarterly installments of 12,500 shares. The compensation includes the amount for services rendered to the Company in his capacity as both an officer and a director.

Other than as described above, at no time during the last fiscal year was any outstanding option otherwise modified or re-priced, and there was no tandem feature, reload feature, or tax-reimbursement feature associated with any of the stock options we granted to our executive officers or otherwise.

We grant stock awards and stock options to our executive officers based on their level of experience and contributions to our Company. The aggregate fair value of awards and options are computed in accordance with FASB ASC 718 and are reported in the Summary Compensation Table above in the columns (e) and (f).

The table below summarizes all of the outstanding equity awards for our named executive officers as of December 31, 2015, our latest fiscal year end.

Outstanding Equity Awards At Fiscal Year-End

	Option Awards					Stock Awards			
Name	Number of securities underlying unexercised options(#) exercisable	Number of securities underlying unexercised options(#) unexercisable	Equity incentive plan awards: number of securities underlying unexercised unearned options (#)	Option exercise price ($)	Option expiration date	Number of shares or units of stock that have not vested (#)	Market value of shares of units of stock that have not vested ($)	Equity incentive plan awards: number of unearned shares, units or other rights that have not vested (#)	Equity incentive plan awards: market or payout value of unearned shares, units or other rights that have not vested ($)
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
Thomas E. Zelibor		100,000		0.86	11/09/25				

CEO, Chairman of the Board(1)(3)	350,000		0.70	6/30/25
	250,000		1.01	12/19/16
	500,000		1.30	4/30/22
	40,000		0.92	3/4/24
James S. Marcelli President, COO, Director(2)(3)	25,000	25,000	0.67	8/9/25
	1,150,000		0.70	6/30/25
	100,000		1.00	5/16/23

(1)

On November 10, 2015, Mr. Zelibor received an option to purchase up to 100,000 shares of Company stock at an exercise price of $0.86 per share. The option vests 12,500 shares on January 1, 2016 and the remaining vest quarterly in equal installments of 12,500 shares beginning April 1, 2016. On July 1, 2015, Mr. Zelibor received an option to purchase up to 350,000 shares of Company stock at an exercise price of $0.70 that vested immediately. On March 4, 2014, Mr. Zelibor received an option to purchase 40,000 shares of common stock at an exercise price of $0.92 per share. The options vested quarterly over one year in equal installments of 10,000 beginning April 1, 2014. On May 1, 2012, Mr. Zelibor received an option to purchase up to 500,000 shares of common stock at an exercise price of $1.30 per share. The options vested quarterly over one year in equal installments of 125,000 shares per quarter beginning May 1, 2012. On December 19, 2011, Mr. Zelibor received an option to purchase up to 250,000 shares of common stock at an exercise price of $1.01 per share. The option vested 62,500 shares immediately and the remaining annually over three years in equal annual installments of 62,500 shares per year beginning December 19, 2011.

(2)

On August 10, 2015, Mr. Marcelli received an option to purchase 50,000 shares of common stock. The options vest 12,500 immediately and the remainder in equal quarterly installments of 12,500 shares. On July 1, 2015, Mr. Marcelli received an option to purchase up to 1,150,000 shares of Company stock at an exercise price of $0.70 that vested immediately. August 1, 2013, Mr. Marcelli received an option to purchase up to 100,000 shares of common stock. The options vested in equal installments of 25,000 options with the first installment vesting on August 1, 2013 and the remaining installments vesting quarterly commencing on October 1, 2013.

(3)

In the event of a change in control of our Company, such person s options will become fully vested and/or exercisable, as the case may be, immediately prior to such change in control, and shall remain exercisable as set forth in their stock option agreement.

Compensation of Directors

Set forth below is a summary of the compensation of our directors during our December 31, 2015 fiscal year.

Name	Fees Earned or Paid in Cash ($)	Stock Awards ($)	Option Awards ($)	Non-Equity Incentive Plan Compensation ($)	Non-Qualified Deferred Compensation Earnings ($)	All Other Compensation ($)	Total ($)
Thomas E. Zelibor (1)							
James S. Marcelli (1)							
Andrew J. Ashton (1)							
William C. Pickett, III (2)			180,115				180,115
Joseph A. Miller (3)			24,901				24,901
Ronald A. Bucchi, (4)			40,909				40,909
Siraj Nour El-Ahmadi (5)			68,428				68,428
George L. Lauro (6)	18,871	10,000	55,529				84,400
Michael Lebby (7)	15,581	8,387	30,518				54,486

(1)

Serves as an executive officer and a director, but receives no additional compensation for serving as a director.

(2)

On January 1, 2014, Mr. Pickett received an option to purchase up to 50,000 shares of Company stock at an exercise price of $0.715 that vest pursuant to the following schedule: 20,000 shares vested immediately; and the remaining options vest in equal quarterly installments of 10,000 per quarter commencing on April 1, 2014. On March 4, 2015, Mr. Pickett received an option to purchase up to 50,000 shares of Company stock at an exercise price of $0.80 that vest pursuant to the following schedule: 20,000 shares vested immediately; and the remaining options vest in 3 equal annual installments of 10,000 options per year commencing on April 1, 2015. On July 1, 2015, Mr. Pickett received an option to purchase up to 350,000 shares of Company stock at an exercise price of $0.70 that vested immediately.

(3)

On May 10, 2011, Mr. Miller received an option to purchase up to 200,000 shares of Company stock at an exercise price of $1.12 that vest pursuant to the following schedule: 50,000 shares vested immediately; and the remaining options vest in 3 equal annual installments of 50,000 options per year commencing on May 10, 2012. On January 1, 2014, Mr. Miller received an option to purchase up to 50,000 shares of Company stock at an exercise price of $0.715 that vest pursuant to the following schedule: 20,000 shares vested immediately; and the remaining options vest in equal quarterly installments of 10,000 per quarter commencing on April 1, 2014. On March 4, 2015, Mr. Miller received an option to purchase up to 50,000 shares of Company stock at an exercise price of $0.80 that vest pursuant to the following schedule: 20,000 shares vested immediately; and the remaining options vest in 3 equal annual installments of 10,000 options per year commencing on April 1, 2015.

(4)

On June 11, 2012, Mr. Bucchi received an option to purchase up to 200,000 shares of Company stock at an exercise price of $0.90 that vest pursuant to the following schedule: 50,000 shares vested immediately; and the remaining options vest in 3 equal annual installments of 50,000 options per year commencing on June 11, 2013. On August 29, 2013, Mr. Bucchi received an option to purchase up to 50,000 shares of Company stock at an exercise price of $0.84 that vest pursuant to the following schedule: 20,000 shares vested immediately; and the remaining options vest in equal quarterly installments of 10,000 options per quarter commencing on October 1, 2013. On January 1, 2014, Mr. Bucchi received an option to purchase up to 50,000 shares of Company stock at an exercise price of $0.715 that vest pursuant to the following schedule: 20,000 shares vested immediately; and the remaining options vest in equal quarterly installments of 10,000 per quarter commencing on April 1, 2014. On March 4, 2015, Mr. Bucchi received an option to purchase up to 50,000 shares of Company stock at an exercise price of $0.80 that vest pursuant to the following schedule: 20,000 shares vested immediately; and the remaining options vest in 3 equal annual installments of 10,000 options per year commencing on April 1, 2015.

(5)

On November 1, 2013, Mr. Siraj Nour El-Ahmadi received an option to purchase up to 200,000 shares of Company stock at an exercise price of $0.93 that vest pursuant to the following schedule: 50,000 shares on November 1, 2013 and the remaining options vest in equal annual installments of 50,000 options per year commencing on November 1, 2014. On January 1, 2014, Mr. Siraj Nour El-Ahmadi received an option to purchase up to 50,000 shares of Company stock at an exercise price of $0.715 that vest pursuant to the following schedule: 20,000 shares vested immediately; and the remaining options vest in equal quarterly installments of 10,000 per quarter commencing on April 1, 2014. On March 4, 2015, Mr. Siraj Nour El-Ahmadi received an option to purchase up to 50,000 shares of Company stock at an exercise price of $0.80 that vest pursuant to the following schedule: 20,000 shares vested immediately; and the remaining options vest in 3 equal annual installments of 10,000 options per year commencing on April 1, 2015.

(6)

During 2015 Mr. Lauro received $18,871 in cash and 12,040 shares of common stock as compensation for serving on our Operations Committee. On May 12, 2014, Mr. Lauro received an option to purchase up to 200,000 shares of Company stock at an exercise price of $0.763 that vest pursuant to the following schedule: 50,000 shares vested immediately; and the remaining options vest in 3 equal annual installments of 50,000 options per year commencing on May 12, 2015. On March 4, 2015, Mr. Lauro received an option to purchase up to 50,000 shares of Company stock at an exercise price of $0.80 that vest pursuant to the following schedule: 20,000 shares vested immediately; and the remaining options vest in 3 equal annual installments of 10,000 options per year commencing on April 1, 2015.

(7)

During 2015 Mr. Lebby received $15,581 in cash and 12,718 shares of common stock as compensation for serving on our Operations Committee. On August 26, 2015, Mr. Lebby received an option to purchase up to 200,000 shares of Company stock at an exercise price of $0.69 that vest pursuant to the following schedule: 50,000 shares vested immediately; and the remaining options vest in 3 equal annual installments of 50,000 options per year commencing on August 26, 2016.

In the event of a change in control of our Company, all of the above person s options become fully vested and/or exercisable, as the case may be, immediately prior to such change in control, and shall remain exercisable as set forth in their stock option agreement.

Compensation Committee

Our Board of Directors currently has no standing compensation committee or committee performing similar functions. This is due to the Company s development stage, lack of business operations, the small number of executive officers involved with the Company, and the fact that the Company operates with few employees. The Company s entire Board of Directors currently participates in the consideration of executive officer and director compensation. Our Board of Directors will continue to evaluate, from time to time, whether it should appoint standing compensation committee.

Compensation Policies and Practices As They Relate To Our Risk Management

No risks arise from our Company s compensation policies and practices for our employees that are reasonably likely to have a material adverse effect on our Company.

CERTAIN RELATIONSHIPS AND RELATED PARTY TRANSACTIONS

Policies and Procedures for Related-Party Transactions

Our Company does not have any formal written policies or procedures for related party transactions, however in practice, our board of directors reviews and approves all related party transactions and other matters pertaining to the integrity of management, including potential conflicts of interest, trading in our securities, or adherence to standards of business conduct.

Director Independence

Although we are currently traded on the Over-the-Counter Markets, our Board has reviewed each of the directors relationships with the Company in conjunction with Section 121 and Part 8 (Corporate Governance Requirements) of the listing standards of the NYSE Alternext US and has affirmatively determined that five of our directors, William C. Pickett, III, Joseph A. Miller, Jr. Ronald A. Bucchi, Siraj Nour El-Ahmadi, George L. Lauro, and Michael Lebby are independent directors in that they are independent of management and free of any relationship that would interfere with their independent judgment as members of our Board of Directors. Mr. Bucchi serves as our audit committee financial expert as that term is defined by the rules promulgated by the Securities and Exchange Commission.

Our Company does not have a separately designated nominating or compensation committee or committee performing similar functions; therefore, our full Board of Directors currently serves in these capacities. Three members of our Board of Directors, Thomas E. Zelibor, James S. Marcelli and Andrew J. Ashton, are not are independent directors pursuant to the standards described above.

PRINCIPAL SHAREHOLDERS

The following table sets forth, as of June 2, 2016, the names, addresses, amount and nature of beneficial ownership and percent of such ownership of each person or group known to our Company to be the beneficial owner of more than five percent (5%) of our common stock:

Security Ownership of Certain Beneficial Owners

Name and Address of Beneficial Owner (1)	Amount and Nature of Beneficial Ownership (3)	% of Class Owned (4)
Frederick J. Goetz, Jr. (2)	3,319,542	5.06%
Mary Goetz (2)	4,517,306	6.89%

(1)

In care of our Company at 1831 Lefthand Circle, Suite C, Longmont, CO 80501.

(2)

Frederick J. Goetz, Jr. is Mary Goetz s son.

(3)

To our best knowledge, as of the date hereof, such holders had the sole voting and investment power with respect to the voting securities beneficially owned by them, unless otherwise indicated herein. Includes the person's right to obtain additional shares of common stock within 60 days from the date hereof.

(4)

Based on 65,601,501 shares of common stock outstanding on June 2, 2016. Does not include shares underlying: (i) options to purchase shares of our common stock under our 2007 Plan, or (ii) outstanding warrants to purchase shares of our common stock.

The following table sets forth, as of June 2, 2016, the names, addresses, amount and nature of beneficial ownership and percent of such ownership of our common stock of each of our officers and directors, and officers and directors as

a group:

Security Ownership of Management

Name and Address (1)	Amount and Nature of Beneficial Ownership (2)	% Owned (3)(4)
Thomas E. Zelibor Chief Executive Officer, Principal Executive Officer and Chmn. of the Board of Directors	1,234,324(5)	1.88%
James S. Marcelli President, Chief Operating Officer, Principal Financial Officer and Director	1,553,400(6)	2.36%
Andrew J. Ashton Senior Vice President, Secretary, and Director	2,981,667	4.54%
William C. Pickett, III Director	611,000(7)	*
Joseph A. Miller, Jr. Director	366,800(8)	*
Ronald A. Bucchi Director	577,400(9)	*
Siraj Nour El-Ahmadi Director	290,000(10)	*
George L. Lauro Director	267,727(11)	*
Michael Lebby Director	113,000(12)	*
Directors and Officers as a Group (9 Persons):	7,995,318	12.12%

* Less than 1%.

(1)

In care of our Company at 1831 Lefthand Circle, Suite C, Longmont, CO 80501.

(2)

To our best knowledge, as of the date hereof, such holders had the sole voting and investment power with respect to the voting securities beneficially owned by them, unless otherwise indicated herein. Includes the person's right to obtain additional shares of common stock within 60 days from June 2, 2016.

(3)

Based on 65,601,501 shares of common stock outstanding on June 2, 2016. Does not include shares underlying: (i) options to purchase shares of our common stock under our 2007 Plan and (ii) outstanding warrants to purchase shares of our common stock.

(4)

If a person listed on this table has the right to obtain additional shares of common stock within 60 days from June 2, 2016, the additional shares are deemed to be outstanding for the purpose of computing the percentage of class owned by such person, but are not deemed to be outstanding for the purpose of computing the percentage of any other person.

(5)

Consists of 50,124 shares of common stock, an option to purchase up to 1,177,500 shares of common stock exercisable within 60 days from June 2, 2016 and a warrant to purchase up to 6,700 shares of common stock exercisable within 60 days from June 2, 2016.

(6)

Consists of 246,700 shares of common stock, an option to purchase up to 1,300,000 shares of common stock exercisable within 60 days from June 2, 2016, and a warrant to purchase up to 6,700 shares of common stock exercisable within 60 days from June 2, 2016.

(7)

Consists of 21,000 shares of common stock and an option to purchase up to 590,000 shares of common stock exercisable within 60 days from June 2, 2016.

(8)

Consists of 13,400 shares of common stock, options to purchase up to 340,000 shares of common stock exercisable within 60 days from June 2, 2016 and warrants to purchase up to 13,400 shares of common stock exercisable within 60 days from June 2, 2016.

(9)

Consists of 174,000 shares of common stock, an option to purchase up to 390,000 shares of common stock exercisable within 60 days from June 2, 2016 and warrants to purchase up to 13,400 shares of common stock exercisable within 60 days from June 2, 2016. Mr. Bucchi disclaims beneficial ownership of 53,000 shares held by his spouse.

(10)

Consists of an option to purchase up to 290,000 shares of common stock exercisable within 60 days from June 2, 2016.

(11)

Consists of 27,727 shares of common stock and options to purchase up to 240,000 shares of common stock exercisable within 60 days from June 2, 2016.

(12)

Consists of 23,000 shares of common stock and an option to purchase up to 90,000 shares of common stock exercisable within 60 days from June 2, 2016.

We are not aware of any arrangements that could result in a change of control.

THE PRIVATE PLACEMENTS

July 11, 2014 Offering

On July 11, 2014 we completed a Regulation D Rule 506 private placement Offering solely to accredited investors of Units, with each Unit consisting of 67,000 shares of our common stock and a Warrant to purchase 33,500 shares of common stock at $1.00 per share and 33,500 shares of common stock at $1.25 per share, for $50,000 per Unit, or approximately $0.75 per share of common stock. We also simultaneously completed a Regulation S private placement offering of Units having the same terms as the Regulation D, and in total, the Company sold 60.8 Units for total proceeds to us in both offerings equal to $3,140,000.

Immediately prior to the completion of the Offering, the Company had 53,080,469 shares issued and outstanding, and after the issuance of 4,207,600 shares in the aggregate pursuant to the Offering, or 7.93% of the total issued and outstanding immediately prior to the commencement of the Offering, we had 57,221,069 shares issued and outstanding. We sold 4,207,600 Warrants in the Offering, which, for the avoidance of any doubt, were a part of the Units sold.

In connection with the Offering, each investor executed a subscription agreement which contains, among other things, registration rights whereby we were required, within sixty (60) calendar days from the Closing Date, to register the common stock and the shares of common stock underlying the Warrants by filing a registration statement with the Securities and Exchange Commission, which registration statement was filed on September 9, 2014 and declared effective on September 17, 2014.

Each selling securityholder and its counsel had a reasonable opportunity to review and comment upon the registration statement, and shall have a reasonable opportunity to review and comment upon any amendment thereto and any related prospectus prior to its filing with the SEC.

The Company shall use commercially reasonable efforts to have the registration statement or amendment declared effective by the SEC at the earliest possible date.

The Company shall use commercially reasonable efforts to keep the registration statement effective pursuant to Rule 415 promulgated under the Securities Act and available for sales of all of the securities registered at all times until the date as of which the selling securityholder may sell all of the registrable securities without restriction pursuant to the

last sentence of Rule 144(b)(1)(i) promulgated under the Securities Act (or successor thereto).

The warrants shall expire on the fifth (5th) anniversary of the Closing Date, and may be partially exercised. If at any time after the six month anniversary of the Closing Date, or any successor provision then in effect, there is no effective registration statement registering, or no current prospectus available for, the resale of the shares of common stock underlying the Warrant by the holder, then the Warrant may also be exercised, in whole or in part, solely with respect to such unregistered shares of common stock, at such time by means of a cashless exercise in accordance with the formula set forth in the warrant.

In case the Company shall (i) pay a dividend in its common stock or make a distribution in its Common Stock, (ii) subdivide its outstanding common stock into a greater number of shares, (iii) combine its outstanding common stock into a smaller number of shares (including a recapitalization in connection with any consolidation or merger), then the exercise price on the record date of such division or the effective date of such action shall be adjusted by multiplying such exercise price by a fraction, the numerator of which is the number of shares of common stock outstanding immediately before such event and the denominator of which is the number of shares of common stock outstanding immediately after such event and the number of shares of common stock for which the Warrant may be exercised immediately before such event shall be adjusted by multiplying such number by a fraction, the numerator of which is the exercise price immediately before such event and the denominator of which is the exercise price immediately after such event.

In the case of any consolidation or merger of the Company with or into another corporation (other than any consolidation or merger in which the Company is the continuing corporation and which does not result in any reclassification of the outstanding shares of Common Stock) or the conversion of such outstanding shares of common stock into shares or other stock or other securities or property, or the liquidation, sale or transfer of the property of the Company as an entity or substantially as an entirety and for other unusual events, there shall be deliverable upon exercise of the Warrant (in lieu of the number of shares of common stock theretofore deliverable) the number of shares of stock or other securities or property to which a holder of the number of shares of common stock which would otherwise have been deliverable upon the exercise of this Warrant would have been entitled upon such action if this Warrant had been exercised immediately prior to such action.

The Offering was made directly by us and no underwriter or placement agent was engaged by us in connection with the Offering.

August 2014 Private Placement

On August 25, 2014, we sold one (1) Unit (i.e., 67,000 shares of common stock and a warrant to purchase 33,500 shares of common stock at $1.00 per share and 33,500 shares of common stock at $1.25 per share) to an accredited investor in consideration for $50,000 on terms substantially similar to the Offering including, without limitation, the terms of the warrant. In connection with this sale, we granted such investor piggy back registration rights, and we are therefore registering such investor's 134,000 shares of common stock, of which 67,000 shares underlie warrants which have not been exercised as of the date hereof, in this prospectus.

Sales of our common stock in this offering by the selling securityholders will not affect the rights or privileges of our existing stockholders, except that the economic and voting interests of each of our existing stockholders will be diluted as a result of any issuances of shares underlying the Warrants. Although the number of shares of common stock that our existing stockholders own will not decrease, the shares owned by our existing stockholders will represent a smaller percentage of our total outstanding shares after any such issuances upon the exercise of the Warrants by the selling securityholders.

As of the date of this prospectus, the selling securityholders have sold 2,338,300 shares under the Existing Registration Statement, for which we have not received any proceeds. However, we may receive up to $4,733,550 from the exercise by the selling securityholders of 4,207,600 warrants (i.e., 2,103,800 warrants exercisable at $1.00 per share and 2,103,800 warrants exercisable at $1.25 per share), which remain outstanding as of the date of this prospectus.

SELLING SECURITYHOLDERS

The shares of common stock being offered by the selling securityholders are those previously issued pursuant to the private placements and those which underlie warrants which were issued pursuant to the private placements. We are registering these shares of common stock in order to permit the selling securityholders to offer the shares for resale from time to time.

None of the selling securityholders are licensed broker-dealers or affiliates of licensed broker-dealers.

Except as otherwise set forth in the footnotes herein below, neither the selling securityholders nor any of their affiliates have held a position or office, or had any other material relationship, with us within the past three years.

We do not know when or in what amounts the selling securityholders may offer shares for sale. The selling securityholders may elect not to sell any or all of the shares offered by this prospectus. Because the selling securityholders may offer all, some or none of the shares, we cannot estimate the number of the shares that will be held by the selling securityholders after completion of this offering. However, for purposes of this table, we have assumed that, after completion of the offering, all of the shares covered by this prospectus will be sold by the selling securityholders.

The following table presents information regarding the selling securityholders. The information concerning beneficial ownership has been taken from our stock transfer records and information provided by the selling securityholders and is dated as of June 2, 2016. Except as otherwise set forth in the footnotes herein below, all of the shares beneficially owned by the selling securityholders before the offering were shares issued pursuant to the July and August 2014 private placements described in the section herein entitled The Private Placements and shares which underlie warrants issued pursuant to such private placements. Beneficial ownership has been calculated in accordance with the rules of the SEC, which generally attribute beneficial ownership of securities to persons who possess sole or shared voting power or investment power with respect to those securities and include shares of common stock issuable pursuant to the exercise of stock options or warrants that are either immediately exercisable or exercisable within 60 days of June 2, 2016.

Selling Securityholders	**Shares Beneficially Owned**	**Percentage of Outstanding Shares**	**Number of Shares being Registered/to**	**Percentage of Outstanding Shares**

	Before Offering	Beneficially Owned Before Offering	be Sold in the Offering	Beneficially Owned After Offering
Lincoln Park Capital Fund, LLC (1)	4,457,963(2)	4.99%	670,000	4.99%
Ondek Investments (3)	857,732	1.31%	67,000	1.21%
Revocable Trust of Joseph A. Miller, Jr. (4)	326,800	*	26,800	*
Phillips Smith Family Trust (5)	13,400	*	13,400	0
Haskell Limited Partnership (6)	701,520(7)	1.07%	268,000	*
Robert C. Bantle Revocable Trust (8)	342,560(9)	*	134,000	*
Rushen Investments Ltd. (10)	134,000	*	134,000	0
Cordovano Family Trust (11)	67,790(12)	*	26,800	*
Periscope Partners LP (13)	73,250(14)	*	67,000	*
Ronald A. Bucchi (15)	577,400(16)	*	26,800	*
Thomas E. Zelibor (17)	1,234,324(18)	1.88%	13,400	1.86%
James S. Marcelli (19)	1,553,400(20)	2.36%	13,400	2.35%
Steven Engler	25,900(21)	*	13,400	*
Herman Verheyen	67,000	*	67,000	0
Walter Caers	67,000	*	67,000	0
Jean Ramijsen	67,000	*	67,000	0
Jan Serrien	108,433 (22)	*	67,000	*
Andreas Verder	67,000	*	67,000	0
Walter Mortelmans	134,000	*	134,000	0
Patrick Rosa	67,000	*	67,000	0
Rudi Wynen	67,000	*	67,000	0
Luc Jansen	191,299 (23)	*	67,000	*
Patrick Frankignoul	134,000	*	134,000	0
Fernand Frankignoul	149,866 (24)	*	134,000	*

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Selling Securityholders	Shares Beneficially Owned Before Offering	Percentage of Outstanding Shares Beneficially Owned Before Offering	Number of Shares being Registered/to be Sold in the Offering	Percentage of Outstanding Shares Beneficially Owned After Offering
Jacques de Groot	67,000	*	67,000	0
Bert Jansen	33,500	*	33,500	0
Luc Olluyn	67,000	*	67,000	0
D.J. Van Beem	67,000	*	67,000	0
Guido Cloetens	33,500	*	33,500	0
Geraldina Van Loock	67,000	*	67,000	0
Rene Vijt	67,000	*	67,000	0
Marc Haverhals	67,000	*	67,000	0
Michael and Lisa Ramone	268,000	*	268,000	0
Andrew Kolenda	640,932(25)	*	375,200	*
Richard A. O'Halloran	299,732(26)	*	134,000	*
Gary A. Bryde	134,000	*	134,000	0
Jeffrey A. Berlin	536,000	*	536,000	0
Steven R. Fasick	248,500(27)	*	134,000	*
Donald E. Pyle	1,684,528(28)	2.57%	113,900	2.39%
Richard Smith	95,800(29)	*	26,800	*
Stephen E. Hart	964,120	1.47%	335,000	0
Michael D. Loessner	134,000	*	134,000	0
Paul Berger	67,000	*	67,000	0
David M. Bovi	804,000(30)	1.23%	134,000	1.02%
David Liu	366,732(31)	*	134,000	*
William T. Ondek	924,732(32)	1.41%	67,000	1.31%
David Malatesta	1,032,598(33)	1.57%	268,000	1.17%
Daniel Malatesta	699,098(34)	1.07%	201,000	*
Robert W. Ashton	207,530(35)	*	134,000	0

* Less than one percent (1%).

(1) Josh Scheinfeld and Jonathan Cope, the principals of Lincoln Park, are deemed to be beneficial owners of all of the shares of common stock owned by Lincoln Park. Messrs. Scheinfeld and Cope have shared voting and disposition power over such shares being offered under this prospectus.
(2) Although Lincoln Park beneficially owns 4,457,963 shares, 1,795,010 shares underlie warrants which may not be exercised to the extent that Lincoln Park s ownership would exceed 4.99% in accordance with the terms of said warrants.
(3) William T. Ondek is deemed to be the beneficial owner of all of the shares of common stock owned by Ondek Investments. Mr. Ondek has sole voting and disposition power over such shares being offered under this prospectus.
(4) Joseph A. Miller is deemed to be the beneficial owner of all of the shares of common stock owned by the Revocable Trust of Joseph A. Miller, Jr. Mr. Miller has sole voting and disposition power over such shares being offered under this prospectus. Mr. Miller is the beneficial owner of 13,400 shares of common stock and also owns options and warrants to purchase up to 313,400 shares of common stock. Mr. Miller serves as Director of the Company.
(5) Phillips Smith has sole voting and disposition power over such shares being offered under this prospectus.
(6) Richard Haskell is deemed to be the beneficial owner of all of the shares of common stock owned by Haskell Limited Partnership. Mr. Haskell has sole voting and disposition power over such shares being offered under this prospectus.
(7) Of the shares beneficially owned before the offering, 268,000 underlie warrants issued pursuant to the private placements.
(8) Robert C. Bantle is deemed to be the beneficial owners of all of the shares of common stock owned by Robert C. Bantle Revocable Trust, dated December 16, 2010. Mr. Bantle has sole voting and disposition power over such shares being offered under this prospectus.
(9) Of the shares beneficially owned before the offering, 140,530 were issued pursuant to the private placements and 140,530 underlie warrants issued pursuant to the private placements.

(10) Melissa A. Lawey and Sion Blokland, the principals of Rushen Investments Ltd., are deemed to be beneficial owners of all of the shares of common stock owned by Rushen Investments Ltd. Ms. Lawey and Mr. Blokland have shared voting and disposition power over such shares being offered under this prospectus.
(11) Steven Cordovano is deemed to be the beneficial owner of all of the shares of common stock owned by the Cordovano Family Trust. Mr. Cordovano has sole voting and disposition power over such shares being offered under this prospectus. Mr. Cordovano is the beneficial owner of options to purchase up to 25,000 shares of common stock.
(12) Of the shares beneficially owned before the offering, 13,400 were issued pursuant to the private placements and 13,400 underlie warrants issued pursuant to the private placements.
(13) Leon Frenkel is deemed to be the beneficial owner of all of the shares of common stock owned by Periscope Partners LP. Mr. Frenkel has sole voting and disposition power over such shares being offered under this prospectus.
(14) Consists of 6,250 shares of common stock and warrants to purchase up to 67,000 shares of common stock. Of the shares beneficially owned before the offering, 67,000 underlie warrants issued pursuant to the private placements.
(15) Ronald A. Bucchi serves as Director of the Company.
(16) Consists of 174,000 shares of common stock, an option to purchase up to 390,000 shares of common stock exercisable within 60 days and warrants to purchase up to 13,400 shares of common stock exercisable within 60 days. Mr. Bucchi disclaims beneficial ownership of 53,000 shares held by his spouse. Of the shares beneficially owned before the offering, 13,400 were issued pursuant to the private placements and 13,400 underlie warrants issued pursuant to the private placements.
(17) Thomas E. Zelibor serves as Director and Chief Executive Officer of the Company.
(18) Consists of 50,124 shares of common stock, an option to purchase up to 1,177,500 shares of common stock exercisable within 60 days and a warrant to purchase up to 6,700 shares of common stock exercisable within 60 days. Of the shares beneficially owned before the offering, 6,700 were issued pursuant to the private placements and 6,700 underlie warrants issued pursuant to the private placements.
(19) James S. Marcelli serves as Director, President and Chief Operating Officer of the Company.
(20) Consists of 246,700 shares of common stock, an option to purchase up to 1,300,000 shares of common stock exercisable within 60 days, and a warrant to purchase up to 6,700 shares of common stock exercisable within 60 days. Of the shares beneficially owned before the offering, 6,700 were issued pursuant to the private placements and 6,700 underlie warrants issued pursuant to the private placements.
(21) Consists of options to purchase up to 12,500 and warrants to purchase 6,700 shares of common stock exercisable within 60 days. Of the shares beneficially owned before the offering, 6,700 were issued pursuant to the private placements and 6,700 underlie warrants issued pursuant to the private placements.
(22) Consists of 74,933 shares of common stock and warrants to purchase up to 33,500 shares of common stock exercisable within 60 days. Of the shares beneficially owned before the offering, 33,500 were issued pursuant to the private placements and 33,500 underlie warrants issued pursuant to the private placements.
(23) Consists of 124,299 shares of common stock and warrants to purchase up to 67,000 shares of common stock exercisable within 60 days. Of the shares beneficially owned before the offering, 67,000 underlie warrants issued pursuant to the private placements.
(24) Consists of 82,866 shares of common stock and warrants to purchase up to 67,000 shares of common stock exercisable within 60 days. Of the shares beneficially owned before the offering, 67,000 were issued pursuant to the private placements and 67,000 underlie warrants issued pursuant to the private placements.
(25) Consists of 370,466 shares of common stock and warrants to purchase up to 270,466 shares of common stock exercisable within 60 days. Of the shares beneficially owned before the offering, 187,600 were issued pursuant

to the private placements and 187,600 underlie warrants issued pursuant to the private placements.

(26) Consists of 149,866 shares of common stock and warrants to purchase up to 149,866 shares of common stock exercisable within 60 days. Of the shares beneficially owned before the offering, 67,000 were issued pursuant to the private placements and 67,000 underlie warrants issued pursuant to the private placements.

(27) Consists of 114,500 shares of common stock and warrants to purchase up to 134,000 shares of common stock exercisable within 60 days. Of the shares beneficially owned before the offering, 134,000 underlie warrants issued pursuant to the private placements.

(28) Of the shares beneficially owned before the offering, 113,900 underlie warrants issued pursuant to the private placements.

(29) Of the shares beneficially owned before the offering, 13,400 were issued pursuant to the private placements and 13,400 underlie warrants issued pursuant to the private placements.

(30) Consists of 737,000 shares of common stock and warrants to purchase up to 67,000 shares of common stock exercisable within 60 days. Of the shares beneficially owned before the offering, 67,000 were issued pursuant to the private placements and 67,000 underlie warrants issued pursuant to the private placements.

(31) Of the shares beneficially owned before the offering, 67,000 were issued pursuant to the private placements and 67,000 underlie warrants issued pursuant to the private placements.
(32) Includes (i) 857,732 shares of common stock and warrants held by Ondek Investments, and (ii) 67,000 shares underlying warrants held by William T. Ondek in his individual capacity.
(33) Of the shares beneficially owned before the offering, 134,000 were issued pursuant to the private placements and 134,000 underlie warrants issued pursuant to the private placements.
(34) Of the shares beneficially owned before the offering, 100,500 were issued pursuant to the private placements and 100,500 underlie warrants issued pursuant to the private placements.
(35) Consists of 140,530 shares of common stock and a warrant to purchase up to 67,000 shares of common stock exercisable within 60 days. Of the shares beneficially owned before the offering, 67,000 were issued pursuant to the private placements and 67,000 underlie warrants issued pursuant to the private placements.

DESCRIPTION OF SECURITIES

As of the date of this prospectus, our articles of incorporation authorizes us to issue 250,000,000 shares of common stock, par value $0.001 per share, and 1,000,000 shares of preferred stock, par value $0.001 per share. As of June 2, 2016, 65,601,501 shares of common stock were outstanding and no shares of preferred stock were outstanding. Our articles of incorporation were amended on June 8, 2015 to increase our authorized shares of common stock to 250,000,000 from 100,000,000.

As of June 2, 2016, we also had outstanding (a) options to purchase 6,759,500 shares of our common stock pursuant to our 2007 Employee Stock Plan, of which 6,268,250 have vested as of the date of this prospectus, at a weighted average exercise price of $0.82 per share and (b) warrants to purchase an aggregate of 12,263,867 shares of our common stock (including 3,977,568 shares underlying the warrants issued pursuant to this private placement), of which 12,197,193 have vested as of the date of this prospectus, at a weighted average exercise price of $0.96 per share.

The following summary description of our capital stock is based on the provisions of our articles of incorporation as well as our bylaws and the applicable provisions of the Nevada Revised Statutes. This information is qualified entirely by reference to the applicable provisions of our articles of incorporation, as amended to date, our bylaws, as amended to date and the Nevada Revised Statutes. For information on how to obtain copies of our articles of incorporation and bylaws, which are exhibits to the registration statement of which this prospectus is a part, see Where You Can Find Additional Information .

Common Stock

Each outstanding share of common stock is entitled to one vote on all matters to be submitted to a vote of the stockholders. Holders do not have preemptive rights, so we may issue additional shares that may reduce each holder's voting and financial interest in our Company. Cumulative voting does not apply to the election of directors, so holders of more than 50% of the shares voted for the election of directors can elect all of the directors. All elections for directors shall be decided by a plurality vote; all other questions shall be decided by majority vote except as otherwise provided by Nevada Statutes. Our bylaws permit the holders of the same percentage of all stockholders entitled to vote at a meeting to take action by written consent without a meeting.

Holders of common stock are entitled to receive dividends when, as and if declared by the board of directors out of funds legally available therefor. In the event of liquidation, dissolution or winding up of our Company, holders are entitled to share ratably in all assets remaining available for distribution to them after payment of liabilities and after

provision has been made for each class of stock, if any, having preference over the common stock. Holders do not have any conversion, redemption provisions or other subscription rights. All of the outstanding shares of common stock are fully paid and non-assessable.

Preferred Stock

Pursuant to our Company's Articles of Incorporation, our board of directors is empowered, without stockholder approval, to issue series of preferred stock with any designations, rights and preferences as they may from time to time determine. The rights and preferences of this preferred stock may be superior to the rights and preferences of our common stock; consequently, preferred stock, if issued, could have dividend, liquidation, conversion, voting or other rights that could adversely affect the voting power or other rights of the common stock. Additionally, Preferred stock, if issued, could be utilized, under special circumstances, as a method of discouraging, delaying or preventing a change in control of our business or a takeover from a third party.

2007 Employee Stock Plan

The principal terms and provisions of the 2007 Plan are summarized below. As a summary, the description below is not a complete description of all the terms of the 2007 Plan and is qualified in its entirety by reference to the full text of the 2007 Plan.

Types of Awards

Both incentive stock options, or ISOs, and nonqualified stock options, or NSOs, and stock grants and stock purchase rights may be granted under the 2007 Plan. ISOs receive favorable tax treatment on exercise, and may receive favorable tax treatment on a qualifying disposition of the underlying shares. However, ISOs must comply with certain requirements regarding exercise price, maximum term and post termination exercise period, and must be issued under a stockholder-approved plan. NSOs are not subject to these requirements, nor may they receive this favorable tax treatment upon exercise.

Administration

The 2007 Plan will be administered by either the Board of Directors of the Company or a Stock Plan Committee (Committee) appointed by the Board of Directors.

Eligibility

Awards under the 2007 Plan may only be made as follows: ISOs may be granted to any employee of the Company. Officers and directors of the Company who are not employees may not be granted ISOs under the Plan. Non-Qualified Options, stock grants and authorizations to make stock purchases may be granted to any director whether or not an employee), officer, employee or consultant of the Company.

Number of Shares

The aggregate number of shares that may be issued pursuant to the 2007 Plan is 10,000,000, subject to adjustment as described below.

Adjustments

In the event of a subdivision of the outstanding common stock, a declaration of a dividend payable in shares of common stock, a combination or consolidation of the outstanding common stock into a lesser number of shares of common stock, a recapitalization, a reclassification or a similar occurrence, the Committee shall make appropriate adjustments, subject to the limitations set forth in the 2007 Plan.

Transferability

No ISO shall be assignable or transferable by the grantee except by will or by the laws of descent and distribution, and during the lifetime of the grantee each ISO shall be exercisable only by him. All other awards under the 2007 Plan shall be freely transferable subject to certain limitations imposed by the 2007 Plan, when applicable.

Termination of Service

Each option shall set forth the extent to which the optionee shall have the right to exercise their option following termination of the optionee's employment with the Company. Such provisions shall be determined in the sole discretion of the Board of Directors or Committee, and need not be uniform among all options issued pursuant to the Plan. Notwithstanding the foregoing, and to the extent required by applicable law, each option shall provide that the optionee shall have the right to exercise the vested portion of any option held at termination for at least ninety (90) days following termination of employment with the Company for any reason, and that the optionee shall have the right to exercise the option for at least twelve (12) months if the optionee's employment terminates due to death or disability.

Amendment and Termination

The 2007 Plan, as set forth herein, became effective on October 1, 2007, the date of its adoption by the Board of Directors, subject to the approval of the holders of a majority of the outstanding shares of common stock of the Company within 12 months therefrom. Unless sooner terminated pursuant to the terms of the 2007 Plan, the 2007 Plan will terminate on September 30, 2016. The Board of Directors may terminate or amend the 2007 Plan at any time except that, the holders of a majority of the outstanding shares of common stock must approve certain amendments. Except as provided for in the 2007 Plan, the Board of Directors or stockholders cannot alter or impair the rights of an optionee, without his consent, under any award previously granted to him under the 2007 Plan.

Warrants

As of June 2, 2016, there are outstanding warrants to purchase an aggregate of 12,263,867 shares of our common stock, of which 12,197,193 have vested, at a weighted average exercise price of $0.96 per share.

Nevada Anti-Takeover Law and Charter and Bylaws Provisions

Nevada Revised Statutes sections 78.378 to 78.3793 provide state regulation over the acquisition of a controlling interest in certain Nevada corporations unless the articles of incorporation or bylaws of the corporation provide that the provisions of these sections do not apply. Our articles of incorporation and bylaws do not state that these provisions do not apply. The statute creates a number of restrictions on the ability of a person or entity to acquire control of a Nevada company by setting down certain rules of conduct and voting restrictions in any acquisition attempt, among other things. The statute is limited to corporations that are organized in the state of Nevada and that have 200 or more shareholders, at least 100 of whom are shareholders of record and residents of the State of Nevada; and does business in the State of Nevada directly or through an affiliated corporation. Because of these conditions, the statute does not apply to our Company.

Provisions of our Articles of Incorporation and our Bylaws may delay or discourage transactions involving an actual or potential change in our control or change in our management. Therefore, these provisions could adversely affect the price of our common stock. Among other things, our Articles of Incorporation and our Bylaws (i) provide that the Bylaws may be altered, amended or repealed and new Bylaws may be adopted only by the board of directors, (ii) provide that the authorized number of directors, which may not be less than three or more than nine, may be changed only by resolution of the board of directors, (iii) permit our board of directors to issue up to 1,000,000 shares of preferred stock, with any rights, preferences and privileges as they may designate, including the right to approve an acquisition or other change in our control and (iv) our Articles of Incorporation provide that the shareholders shall not have pre-emptive rights to acquire unissued shares of the stock of the Company.

Transfer Agent

Our transfer agent is Broadridge Corporate Issuer Solutions, Inc., located at 44 W Lancaster Ave., Ardmore, Pennsylvania 19003, telephone number (610) 649-7300 and facsimile number (610) 649-7302.

OTC Markets (OTCQB)

Our common stock is quoted on the OTC Markets (OTCQB) under the trading symbol LWLG .

PLAN OF DISTRIBUTION

This prospectus relates to the resale of up to 6,076,900 shares of our common stock by certain selling securityholders named herein, which includes 4,207,600 shares of common stock underlying warrants held by such selling securityholders.

The selling securityholders named herein and any of their pledgees, assignees and successors-in-interest may, from time to time, sell any or all of their shares of our common stock covered hereby on the principal trading market 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 securityholder 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;
- settlement of short sales entered into after the effective date of the registration statement of which this prospectus is a part;
- in transactions through broker-dealers that agree with the selling securityholders 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 securityholders may also sell shares under Rule 144 under the Securities Act, if available, rather than under this prospectus.

Broker-dealers engaged by the selling securityholders may arrange for other brokers-dealers to participate in sales. Broker-dealers may receive commissions or discounts from the selling securityholders (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 FINRA Rule 2440; and in the case of a principal transaction a markup or markdown in compliance with FINRA IM-2440.

In connection with the sale of the common stock or interests therein, the selling securityholders 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 securityholders may also sell shares of the common stock short and deliver these securities to close out their short positions, or loan or pledge the common stock to broker-dealers that in turn may sell these securities. The selling securityholders may also enter into option or other transactions with broker-dealers or other financial institutions or create 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 securityholders 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. No selling securityholder has informed the Company that it has 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%).

The Company is required to pay certain fees and expenses incurred by the Company incident to the registration of the shares.

Because selling securityholders 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. No selling securityholder has advised us that there is an underwriter or coordinating broker acting in connection with the proposed sale of the resale shares by the selling securityholders.

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 of common stock covered hereby 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 securityholders 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 securityholders or any other person. We will make copies of this prospectus available to the selling securityholders 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 securities being offered by this prospectus has been passed upon for us by Burton Bartlett & Glogovac, Reno, Nevada.

EXPERTS

Morison Cogen LLP, our independent registered public accounting firm, has audited our balance sheets as of December 31, 2015 and 2014 and the related statements of operations, stockholders equity and cash flows for the years then ended and for the period from January 1, 2004 (inception of development stage) through December 31, 2015. We have included our financial statements in this prospectus and elsewhere in the registration statement of which it is a part in reliance on Morison Cogen LLP s report, given on their authority as experts in accounting and auditing.

WHERE YOU CAN FIND ADDITIONAL INFORMATION

We filed with the Securities and Exchange Commission a registration statement under the Securities Act for the shares of common stock in this offering and a post-effective amendment to the registration statement. This prospectus does not contain all of the information in the registration statement and the exhibits and schedule that were filed with the registration statement. For further information with respect to us and our common stock, we refer you to the registration statement and the exhibits and schedule that were filed with the registration statement. Statements contained in this prospectus about the contents of any contract or any other document that is filed as an exhibit to the registration statement are not necessarily complete, and we refer you to the full text of the contract or other document filed as an exhibit to the registration statement. A copy of the registration statement and the exhibits and schedules that were filed with the registration statement may be inspected without charge at the Public Reference Room maintained by the Securities and Exchange Commission at 100 F Street, N.E. Washington, DC 20549, and copies of all or any part of the registration statement may be obtained from the Securities and Exchange Commission upon payment of the prescribed fee. Information regarding the operation of the Public Reference Room may be obtained by calling the Securities and Exchange Commission at 1-800-SEC-0330. The Securities and Exchange Commission maintains a website that contains reports, proxy and information statements, and other information regarding registrants that file electronically with the SEC. The address of the website is www.sec.gov.

We file periodic reports under the Exchange Act, including annual, quarterly and special reports, and other information with the Securities and Exchange Commission. These periodic reports and other information are available for inspection and copying at the regional offices, public reference facilities and website of the Securities and

Exchange Commission referred to above.

We make available free of charge on or through our internet website our annual reports on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act as soon as reasonably practicable after we electronically file such material with, or furnish it to, the Securities and Exchange Commission.

DISCLOSURE OF COMMISSION POSITION ON INDEMNIFICATION FOR SECURITIES ACT LIABILITY

Insofar as indemnification for liabilities arising under the Securities Act may be permitted to directors, officers or persons controlling the registrant pursuant to the foregoing provisions, the registrant has been informed that in the opinion of the SEC such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable.

INDEX TO FINANCIAL STATEMENTS

LIGHTWAVE LOGIC, INC.

LIGHTWAVE LOGIC, INC.

BALANCE SHEETS

	March 31, 2016 (Unaudited)	December 31, 2015 (Audited)
ASSETS		
CURRENT ASSETS		
Cash and cash equivalents	$ 3,021,734	$ 3,730,705
Prepaid expenses and other current assets	120,399	264,491
	3,142,133	3,995,196
PROPERTY AND EQUIPMENT - NET	470,438	495,062
OTHER ASSETS		
Intangible assets - net	626,244	619,767
TOTAL ASSETS	$ 4,238,815	$ 5,110,025
LIABILITIES AND STOCKHOLDERS' EQUITY		
CURRENT LIABILITIES		
Accounts payable	$ 84,338	$ 32,852
Accounts payable and accrued expenses- related parties	14,132	5,069
Accrued expenses	30,751	65,036
TOTAL LIABILITIES	129,221	102,957
STOCKHOLDERS' EQUITY		
Preferred stock, $0.001 par value, 1,000,000 authorized No shares issued or outstanding		
Common stock $0.001 par value, 250,000,000 authorized 65,598,161 and 65,237,879 issued and outstanding at March 31, 2016 and December 31, 2015	65,598	65,238
Additional paid-in-capital	46,940,627	46,541,251
Accu		