

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

FORM 10-K

- Annual Report pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934:
For the fiscal year ended: **December 31, 2016**
- Transition report pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934:
For the transition period from:

XG SCIENCES, INC.

(Exact name of registrant as
specified in its charter)

Michigan

(State or other jurisdiction of
incorporation or organization)

333-209131

(Commission File No.)

20-4998896

(I.R.S. Employer Identification
No.)

**3101 Grand Oak Drive
Lansing, MI 48911**

(Address of principal executive offices) (zip code)

(517) 703-1110

(Issuer Telephone number)

Securities registered under Section 12(b) of the Act: None.

Securities registered under Section 12(g) of the Act: None.

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Exchange Act. Yes No

Indicate by check mark whether the registrant (1) filed all reports required to be filed by Section 13 or 15(d) of the Exchange Act during the past 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes No

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes No

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of the registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. Yes No

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act): Yes No

Indicate by check mark whether the registrant is a large accelerated filer, and 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.

Large accelerated filer

Accelerated filer

Non-accelerated filer (Do not check if a smaller reporting company)

Smaller reporting company

As of June 30, 2016, the aggregate market value of the registrant's common stock held by non-affiliates of the registrant was approximately \$7,462,352, based on the price at which the common equity was last sold (i.e., \$8.00 per share).

The number of shares outstanding of the registrant's Common Stock, no par value per share, as of March 31, 2017 was 1,981,650.

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PART I

Note Regarding Forward-Looking Statements:

The information in this Annual Report on Form 10-K contains “forward-looking statements” and information within the meaning of Section 27A of the Securities Act of 1933, as amended (the “Securities Act”), and Section 21E of the Securities Exchange Act of 1934, as amended (the “Exchange Act”) relating to XG Sciences, Inc., a Michigan corporation and its subsidiary, XG Sciences IP, LLC, a Michigan corporation (collectively referred to as “we”, “us”, “our”, “XG Sciences”, “XGS”, or the “Company”), which are subject to the “safe harbor” created by those sections. These forward-looking statements include, but are not limited to, statements concerning our strategy, future operations, future financial position, future revenues, projected costs, prospects and plans and objectives of management. The words “anticipates,” “believes,” “estimates,” “expects,” “intends,” “may,” “plans,” “projects,” “will,” “would” and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words. We may not actually achieve the plans, intentions or expectations disclosed in our forward-looking statements and you should not place undue reliance on our forward-looking statements.

These forward-looking statements involve known and unknown risks and uncertainties that could cause our actual results, performance or achievements to differ materially from those expressed or implied by the forward-looking statements, including, without limitation, the risks set forth on beginning on page 15 under the section entitled “Risk Factors” herein.

ITEM 1. BUSINESS

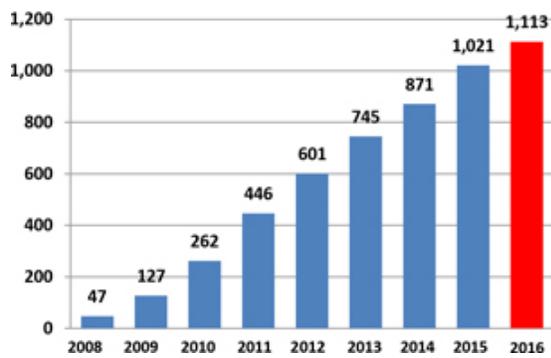
XG Sciences was formed in May 2006 for the purpose of commercializing certain technology to produce graphene nanoplatelets. First isolated and characterized in 2004, graphene is a single layer of carbon atoms configured in an atomic-scale honeycomb lattice. Among many noted properties, monolayer graphene is harder than diamonds, lighter than steel but significantly stronger, and conducts electricity better than copper. Graphene nanoplatelets are particles consisting of multiple layers of graphene. Graphene nanoplatelets have unique capabilities for energy storage, thermal conductivity, electrical conductivity, barrier properties, lubricity and the ability to impart strength when incorporated into plastics or other matrices.

We believe the unique properties of graphene and graphene nanoplatelets will enable numerous new product applications and the market for such products will quickly grow to be a significant market opportunity. Our business model is to design, manufacture and sell advanced materials we call xGnP® graphene nanoplatelets and value-added products based on these nanoplatelets. We currently have hundreds of customers trialing our products for numerous applications, including, but not limited to lithium ion batteries, supercapacitors, thermal shielding and heat transfer, inks and coatings, printed electronics, construction materials, composites, and military uses. We believe our proprietary processes have enabled us to be a low-cost producer of high quality, graphene nanoplatelets and that we are well positioned to address a wide range of end-use applications.

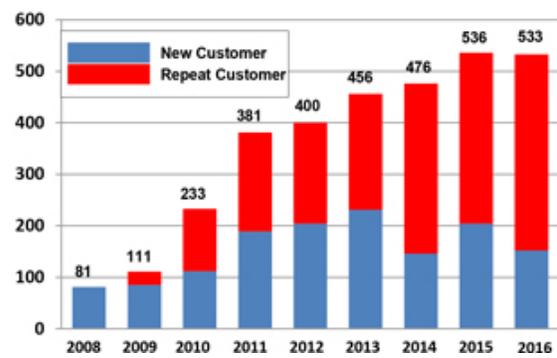
Our Customers

We sell products to customers around the world and have sold materials to over 1,000 customers in 47 countries since 2008. Some of these customers are research organizations and some are commercial organizations. Our customers have included well-known automotive and OEM suppliers around the world (Ford, Johnson Controls, Magna, Honda Engineering), world-scale lithium ion battery manufacturers in the US, South Korea and China (Samsung SDI, LG Chemical, Lishen, A123) and diverse specialty material companies (3M, BASF, Henkel, Dow Chemical, DuPont) as well as leading research centers such as Lawrence Livermore National Laboratory and Oakridge National Laboratory. We have also licensed some of our base manufacturing technology to other companies and we consider technology licensing a component of our business model. Our licensees include POSCO, the fourth largest steel manufacturer in the world by volume of output, and Cabot Corporation (“Cabot”), a leading global specialty chemicals and performance materials company. These licensees further extend our technology through their customer networks. Ultimately, we believe we will benefit in terms of royalties on sales of xGnP® nanoplatelets produced and sold by our licensees. The below bar charts show the number of customers and total orders fulfilled by year based on actual purchases of our materials and orders for free samples or materials used in joint development programs.

Cumulative Customers, by Year



Total Orders, by Year and Customer Type



Our Products

We target our xGnP[®] nanoplatelets for use in a wide range of large and growing end-use markets. Our proprietary manufacturing processes allow us to produce nanoplatelets with varying performance characteristics that can be tuned to specific end-use applications based on customer requirements. We currently offer four commercial “grades” of bulk materials, each of which is available in various particle sizes, which allows for surface areas ranging from 50 to 800 square meters per gram of material depending on the product. Other grades may be made available, depending on the needs for specific applications. In addition, we sell our material in the form of pre-dispersed mixtures with water, alcohol, or other organic solvents and resins. In addition to selling bulk graphene nanoplatelets, we also offer the following value added products that contain our graphene nanoplatelets in various forms:

Energy Storage Materials. These consist of specialty advanced materials that have been formulated for specific applications in the energy storage segment. Chief among these is our proprietary, specially formulated silicon-graphene composite material (also referred to as “SiG” or “XG SiG[®]”) for use in lithium-ion battery anodes. XG SiG[®] targets the never-ending need for higher battery capacity and longer life. In several customer trials, our SiG material has demonstrated three to five times specific storage capacity improvement compared to what is currently available with conventional lithium ion batteries today. Additionally, we offer various bulk materials for use as conductive additives for cathodes and anodes in li-ion batteries, as an additive to anode slurries for lead-carbon batteries, and we are investigating the use of our materials as part of other battery components.

Thermal Management Materials. These consist mainly of two types of products, our XG Leaf[®] sheet products and various thermal interface materials (“TIM”) in the form of custom greases or pastes. XG Leaf[®] is a family of sheet products ideally suited for use in thermal management in portable electronics, which may include cell phones, tablets and notebook PC’s. As these devices continue to adopt faster electronics, higher data management capabilities, brighter displays with ever increasing screen resolution and pixel count, they generate more and more heat. Managing that heat is a key requirement for the portable electronics market and our XG Leaf[®] product line is well suited to address the need. These sheets are made using special formulations of xGnP[®] graphene nanoplatelets as precursors, along with other materials for specific applications. There are several different types of XG Leaf[®] available in various thicknesses, depending on the end-use requirements for thermal conductivity, electrical conductivity, or resistive heating. Our custom TIM greases and pastes are also designed to be used in various high temperature environments. Additionally, we offer various bulk materials for use as active components in liquids, coatings and plastic composites to impart improved thermal management performance to such matrices.

Inks and Coatings. These consist of specially-formulated dispersions of xGnP[®] together with solvents, binders, and other additives to make electrically or thermally conductive products designed for printing or coating and which are showing promise in diverse customer applications such as advanced packaging, electrostatic dissipation and thermal management. We also offer a set of standardized ink formulations suitable for printing. These inks offer the capability to print electrical circuits or antennas, or might be suitable for other electrical or thermal applications. All of these formulations can be customized for specific customer requirements.

Our Focus Areas

We believe we are a “platform play” in advanced materials, because our proprietary processes allow us to produce varying grades of graphene nanoplatelets that can be mapped to a variety of applications in many market segments. However, we are prioritizing our efforts in specific areas and with specific customers that we believe represent opportunities for either relatively near-term revenue or especially large and attractive markets. At this time, we are focused on three high priority areas: Energy Storage, Thermal Management and Composites. The following table shows examples of the types of applications we are pursuing, the expecting timing of revenue and the addressable market size of selected market opportunities.

XGS Market/Application Focus Areas & 2018 Market Size

Key Markets	Energy Storage			Thermal Management		Composites
Application	<u>Lithium Ion Battery</u> Next-Generation Anode	<u>Lithium Ion Battery</u> Cathode Conductive Additive	<u>Pb-Carbon Battery</u> Anode Slurry Additive	<u>Portable Electronics</u> Heat Management Powders/Film	<u>Semi Packaging</u> Heat Management Paste/Adhesive	<u>Specialty Plastics</u> Multi-Function Performance Additive
Performance Driver	Higher Energy Storage Capacity	Increased Rate Performance	Longer Cycle Life, Faster Charge Acceptance	Lower and More Stable Operating Temperatures	Improved Heat Transfer	Improved Thermal, Electrical and Physical Properties
Business Model	Silicon Graphene Composite ("XG SIG®") Sales	xGnP® Powder Sales	xGnP® Powder Sales	xGnP® Powder & Graphene Paper Sales ("XG Leaf®")	Formulated Products Sales	xGnP® Powder Sales
Timing	Near Term to Medium Term	Near Term	Near Term	Near Term to Medium Term	Near Term to Medium Term	Medium Term to Longer Term
Potential Market Size	\$26.5 Bn (Li-ion Battery Cell - 2020) ¹	\$5.2 Bn (LIB Cathode Active Materials - 2020) ¹	\$9-\$12 Bn (Start-Stop Batteries - 2020) ³	\$2,976 Bn (Consumer Electronics - 2020) ⁵	\$28 Bn (Semiconductor Packaging - 2020) ⁷	\$654 Bn (Worldwide Plastics Market - 2020) ⁹
Anticipated Addressable Market Size	\$1.3 Bn (LIB Anode Materials - 2018) ¹	\$200 Mn (LIB Cathode Additives - 2018) ²	\$140 Mn (Anode Slurry Additives - 2018) ⁴	\$900 Mn (Graphitic Heat Spreaders - 2018) ⁶	\$780 Mn (Polymeric Thermal Interface - 2018) ⁸	\$9.1 Bn (Composite Additives - 2018) ¹⁰

Commercialization Process

Because graphene is a new material, most of our customers are still developing applications that use our products. Commercialization is a process, the exact timing of which is often difficult to predict. It starts with our own internal R&D to validate performance for an identified market or customer-specific need. Our customers then validate the performance of our materials and determine whether our products can be incorporated into their manufacturing processes. This is initially done at the pilot scale. Our customers then have to introduce products that incorporate our materials to their own customers to validate performance. After their customers have validated performance, our customers will then move to commercial scale production. Every customer goes through the same process, but will do so at varying speeds, depending on the customer, the product and the end-use market. Thus, we are not always able to predict when our customers will begin ordering commercial volumes of our materials or their expected volumes over time. However, as customers move through the process, we generally receive feedback and gain greater insights regarding their commercialization plans. The following are recent examples of where our products are providing value to our customers at levels that we believe will warrant their use on a commercial basis

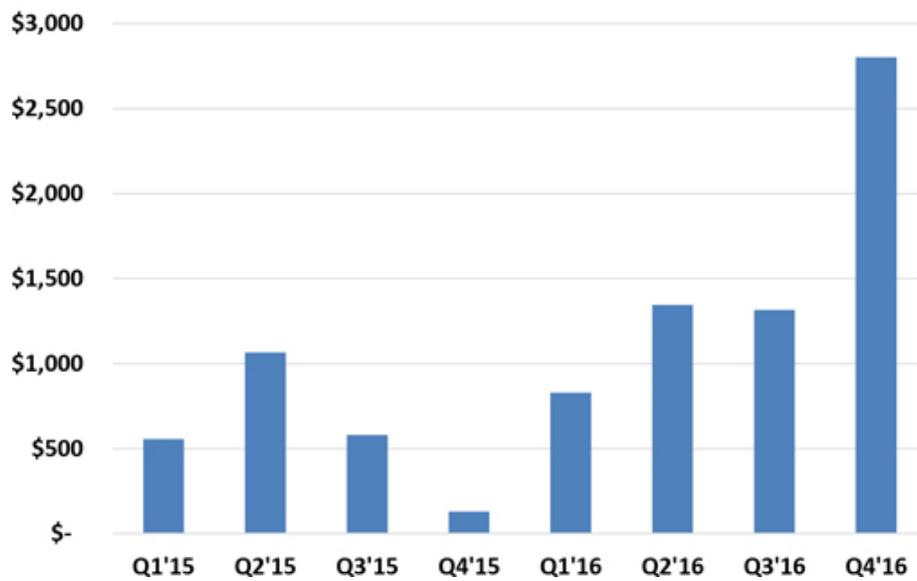
- 1 Avicenne Energy, “The Worldwide Rechargeable Battery Market 2014 – 2025”, 24th Edition — V3, July 2015.
- 2 Avicenne Energy, “The Worldwide Rechargeable Battery Market 2014 – 2025”, 24th Edition — V3, July 2015 & Internal Estimates.
- 3 ArcActive via Nanalyze, April 3, 2015.
- 4 ArcActive via Nanalyze, April 3, 2015 & Internal Estimates.
- 5 Future Markets Insights, “Consumer Electronics Market: Global Industry Analysis and opportunity Assessment 2015 – 2020”, May 8, 2015.

6 PrismaMark, “Market Assessment: Thin Carbon-Based Heat Spreaders”, August 2014.
7 Reporterlink.com, “Semiconductor & IC Packaging Materials Market...”, May 2014.
8 PrismaMark, 2015.
9 Grand View Research, “Global Plastics Market Analysis...”, August 2014.
10 From (9) and internal estimates: 2018 = 305 million tons of plastic, if 10% of the market adopted xGnP to enhance their properties, and at only 1% by weight as an additive, then in 2018 305,000 tons or 305,000,000 kilos of xGnP would be required. At \$30 a Kg — the value is \$9.1 billion per year.

- Lead acid battery manufacturer demonstrating approximately 90% improvement in measured cycle life, appreciable improvement in capacity and charge acceptance and without any loss in water retention performance, and
- Light emitting diode module and product company demonstrated approximately 50% improvement in thermal management capability when compared to existing commercial thermal management products, translating into a 15% improvement in thermal management at the device level, and
- Automotive parts supplier demonstrating improvements in thermal stability for polymer composites incorporating our materials, allowing for approximately 20% higher operating temperatures and a 50% improvement in strength at the elevated temperature, and
- Industrial refrigeration equipment supplier demonstrating improved heat transfer efficiency and energy savings when our xGnP® graphene nanoplatelets are incorporated as a component in the thermal-transfer fluids, and
- Construction company demonstrating less than one weight percent of our product in construction material composites improves flexural strength by more than 30%, and
- Large oil and lubricant supplier showing gear and friction improvements when incorporated into industrial and automotive greases, and
- Engineering design firm for automotive manufacturers found approximately 20% reduction in operating temperature and in thermal uniformity when XG Leaf® replaces standard cooling fins in lithium ion battery packs, and
- Auto manufacturer showing increased tensile and flexural strength and reduced weight in automotive composites.

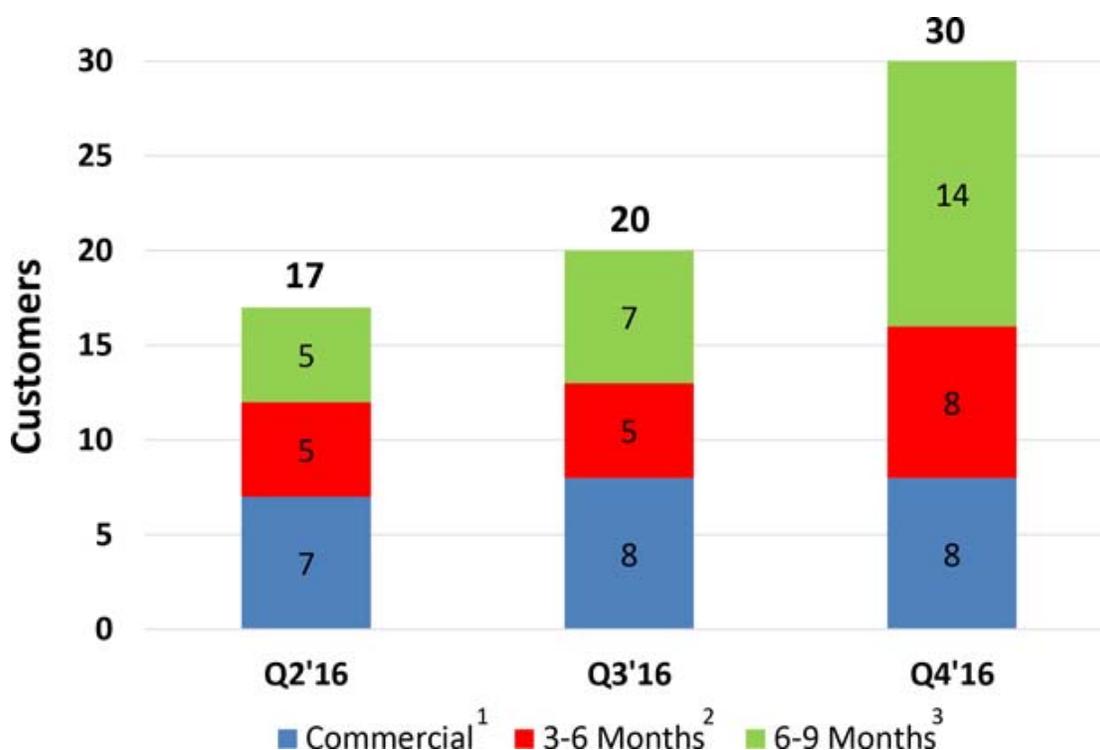
The process of “designing-in” new materials is relatively complex and involves the use of relatively small amounts of the new material in laboratory and engineering development for an extended period of time. Following successful development, we believe customers that incorporate our materials into their products will then order much larger quantities of material to support commercial production. Although, our customers are under no obligation to report to us on the usage of our materials, some have indicated that they have introduced or will soon introduce commercial products that use our materials. Thus, while many of our customers are currently purchasing our materials in kilogram (one or two pound) quantities, we believe many will require tons or even hundreds of tons of material when they commercialize products that incorporate our materials. We believe that those customers already in production will increase their order volume as demand increases and others will begin to move into commercial volume production as they gain more experience in working with our materials and engage new customers. For example, we shipped a 1 ton order in Q4 2016 to a customer who is currently moving into larger scale production and had previously used smaller quantities. The average order size for fulfilled orders (excluding no charge orders) has increased steadily over the last two years and we believe that it will continue to increase in 2017 and 2018 as more customers commercialize products using our products.

Average Order Size of Fulfilled Orders



2017 and 2018 Revenue

We are tracking the commercial and development status of more than 100 customer/product engagements. As of December 31, 2016, we had eight customers who are using our materials in their products and actively selling them to their customers or actively promoting them for future sales. In addition, we have another eight customers who have indicated that they expect to begin shipping product incorporating our materials in the next 3 – 6 months, and have another fourteen customers who have indicated an intent to commercialize in the next 6 – 9 months. We also have tens of customers with whom we are working that have not yet indicated an exact date for commercialization, but we believe have the potential to contribute to revenue in 2017. The following graphic demonstrates the trend over the past 3 quarters as increasingly more customers indicate their intent to commercialize and move into actively selling or promoting products for future sales. We anticipate that the average order size for these customers will increase in 2017 as their demand grows. As a result, we believe we will begin shipping significantly greater quantities of our products, and thus begin scaling revenue in 2017 and 2018. Based on the status of current discussions with customers and their feedback on the performance of our materials in their products, we believe we will be able to recognize approximately \$8 – 10 million of revenue in 2017 and approximately \$20 – \$30 million of revenue in 2018.



(1) Commercial: Customers who are using our materials in their products and actively selling them to their customers or actively promoting them for future sales.

(2) 3 – 6 Months: Customers indicating that they expect to begin shipping product incorporating our materials in the next 3 – 6 months.

(3) 6 – 9 Months: Customers indicating an intent to commercialize in the next 6 – 9 months.

Addressable Markets

The markets that we serve are large and rapidly growing. For example, as shown in the figure below, Avicenne Energy estimates that the market for materials used in lithium ion battery anodes is currently approximately \$1 billion, but is expected to approximately double over the next ten years. We believe our ability to address next generation anode materials represents a significant opportunity for us. According to Prismark Partners, LLC, a leading electronics industry consulting firm specializing in advanced materials, the 2014 market for finished graphitic heat spreaders as sold to the OEM and EMS companies with adhesive, PET, and/or copper backing for selected portable applications was \$600 million, and is expected to reach \$900 million in 2018. The market is currently in a significant expansion period driven by the demand for portable devices. In a press release dated March 31, 2016, Gartner, Inc., a leading research organization, estimated the 2016 global smartphone market at 1.9 billion units and worldwide combined shipments of devices (PC's, tablets, ultraphones and mobile devices) are expected to reach 2.4 billion units in 2016. Every cell phone has some form of thermal management system, and we believe many of the new smart phones and other portable devices being developed can benefit from the thermal management properties of our XG Leaf[®] product line. In August 2016, International Data Corporation (IDC) in their Worldwide Quarterly Tablet Tracker, estimated the global shipment of tablets in 2016 at 183.4 million units. Thus, we believe our XG Leaf[®] product line is well positioned to address very large and rapidly growing markets.

Our Intellectual Property

Some of our proprietary manufacturing processes were developed at Michigan State University (MSU) and licensed to us in 2006. We licensed three U.S. patents and patent applications from MSU. However, over time, our scientists and engineers have made many further discoveries and inventions that are embodied in the form of (and as of December 31, 2016): five additional U.S. patents, two China patents and one allowed but not yet granted, one Taiwan patent, 17 additional U.S. patent applications, and numerous trade secrets. For each patent application filed in the U.S., we make a determination on the nature and value of the patent. For many of the applications filed in the U.S., additional filings are made in other countries such as the European Union, Japan, South Korea, China, Taiwan or other applicable countries. As of December 31, 2016, the Company maintains 35 international patent applications. These filings and analyses are made on a case-by-case basis. Typically, patents that are defensive in nature are not filed abroad, while those that are protective of active XGS products or applications are filed in relevant countries abroad. Our general IP strategy is to keep as trade secrets those manufacturing processes that are difficult to enforce should they be disclosed and to seek patent coverage for other manufacturing processes, materials derived from those processes, unique combinations of materials and end uses of materials containing graphene nanoplatelets. We believe that the combination of our rights under the MSU license, our patents and patent applications, and our trade secrets create a strong intellectual property position.

Our Manufacturing Capacity

We have developed and scaled-up capacity for two proprietary manufacturing processes — one based on chemical intercalation of graphite and subsequent exfoliation and classification; and the second based on a high-shear mechanical process which also employs graphite as the starting material. In March 2012, we took possession of a production facility under terms of a long-term lease and moved our headquarters to this new location. Initial production commenced in this facility in September 2012. Currently, this facility is capable of producing approximately 30 – 50 tons per year of intercalated materials (depending on product mix) if operated on a continuous basis. We also operate a separate production facility in leased manufacturing space which is used for the production of certain graphene nanoplatelets derived from a high-shear mechanical process and also other specialty materials. This facility is capable of producing approximately 30 – 60 tons per year of materials (depending on product mix) if operated on a continuous basis. We believe these manufacturing facilities will be sufficient to meet demands for the majority of our bulk materials for a number of years, with suitable additions of capital equipment as warranted. However, additional manufacturing capabilities for certain value-added products and certain bulk materials remain to be developed and will likely require the acquisition of additional facilities. In particular, the production processes for XG Leaf[®], XG SiG[®] and our conductive inks will require additional capital and additional facilities to meet expected future customer demand.

Many of the Company's products are new products that have not yet been fully developed and for which manufacturing operations have not yet been fully scaled. This means that investors are subject to the risks incident to the creation and development of multiple new products and their associated manufacturing processes. As of the date of this filing, we have not yet demonstrated sales of products at a level capable of covering our fixed expenses. Although we believe we will begin to significantly scale revenue into 2017 and 2018, we have not yet demonstrated the capability to produce sufficient materials to generate the ongoing revenues necessary to sustain our operations in the long-term. For additional information please see "Risk Factors" herein.

Our Lead Investors and Strategic Partners

Since inception and through December 31, 2016, we have raised approximately \$39 million of capital through the issuance of equity and equity-linked securities and through licensing fees and \$3 million through the issuance of certain lease and senior debt obligations. Notable investors and licensees in the Company include:

- Hanwha Chemical Corporation – \$3 million equity investment (December 2010)
- Aspen Advanced Opportunity Fund and affiliates – \$18.5 million in various equity investments (2010 – 2016)
- POSCO Corporation – \$5.2 million in equity investments/license agreement (June 2011 and March 2014)
- Samsung Ventures – \$3 million equity investment (January 2014)
- The Dow Chemical Company – \$2 million drawn on a \$10 million senior debt financing (December 2016)

Our Competitive Strengths

We believe that we are a world leader in the emerging global market for graphene nanoplatelets. The following competitive strengths distinguish us in our industry:

The strength of our intellectual property. Because of our focus on manufacturing process development, we believe we have one of the world's strongest internal knowledge bases in graphene nanoplatelet manufacturing, with most of our proprietary knowledge maintained as trade secrets to avoid the disclosures required by patenting. The 25 US patents and patent applications that we are currently managing (including those under license from MSU) and 39 international patents and patent applications add value by protecting specific equipment, or high-value end-user product applications. The fact that two global companies have evaluated and licensed our production technology provides independent evidence of our technology's effectiveness.

The breadth of our product offering. As far as we are aware, we have the broadest product offering in our industry. In addition to offering four standard grades of bulk graphene nanoplate materials in a range of diameters and surface areas, we offer four different grades of XG Leaf[®] in multiple thicknesses, two different grades of silicon-graphene composite materials, three standard ink formulations, and optional custom dispersions and formulations of our bulk materials. We also offer an XG TIM[™] thermal interface material and a newly introduced GNP[™] cement additive product.

The low-cost nature of our manufacturing processes. As far as we are aware, our manufacturing processes have the potential to be the lowest-cost approaches to the manufacture of graphene nanoplatelets (subject to economies of scale) based on our internal modelling of competitive processes as well as our analysis of alternative technologies.

Our corporate and strategic partners. Three global corporations (Samsung, POSCO, and Hanwha Chemical) have invested over \$11 million in XGS, giving us a significant global reach as well as the ability to leverage the assets of our partners. In addition, The Dow Chemical Company has extended \$10 million in senior debt financing.

Our licensees will accelerate our entry into large markets. Cabot Corporation, the largest U.S.-based manufacturer of carbon particles, and POSCO, one of the world's largest steel producers, have licensed parts of our production technology. We believe these licensees will help us distribute our products and value-added products made with our xGnP[®] nanoplatelets more rapidly than we could do on our own.

The number of development partners that are working with our materials. As of December 31, 2016, we had supplied materials to 242 universities or government laboratories in 41 different countries around the world. A recent search of the U.S. patent database revealed 504 citations of XG Sciences in patents filed by other organizations. These other organizations include Goodrich Corporation, PPG Industries, ExxonMobil Research & Engineering, Toray, Solvay, Honda, Eastman Kodak, Baker Hughes, GM, Rohm and Haas and Sekisui Chemical.

The number of customers purchasing and working with our materials. As of December 31, 2016, we have supplied materials to nearly 900 commercial companies around the world (in addition to universities and research laboratories) who are assessing their performance and potentially designing them into products. We have more than 100 active development relationships where we are working with end-use customers to design products for commercial use. We believe that these relationships will continue to expand.

Our know-how and ability to tailor our products for use in multiple applications. Many of our products and product-development activities target use of our xGnP[®] graphene nanoplatelets in various matrices to form composite products that are then used by our customers. We have extensive knowledge of how to tailor our products to deliver performance as composite products in various applications and we also have knowledge of how to tailor other components of a composite to adjust the performance of the composite for use in various applications.

We believe that the combination of these factors show that XGS is a world leader in the emerging global market for graphene nanoplatelets. Other independent observers have agreed with this assessment. For example, Lux Research, in a July 2015 release listed XGS as a leading worldwide player in its review of the graphene industry. Further, Lux analysts wrote: "XG's march of strategic relationship announcements — Hanwha Chemical in December 2010, POSCO in June 2011, and Cabot in November 2011 — arguably give it the strongest partnership portfolio in the space, and its recent expansion (see the May 7, 2012 LRMJ) makes it one of the low cost and capacity leaders."

Our Significant Accomplishments

Since our founding in May 2006, we have been one of the global pioneers in graphene nanoplatelets. As a prospective manufacturer of a newly discovered advanced material, our development efforts required us to invent appropriate manufacturing processes and methods to scale these processes at economic costs, to hire world-class employees, to introduce our products to customers around the world, and to demonstrate the scientific merits of our materials. Specific accomplishments related to these tasks include, but are not limited to, the following:

- Developed and launched four grades of xGnP[®] graphene nanoplatelets bulk powders.
- Developed and launched five higher-margin, value-added product families:
 - XG Leaf[®] sheet products for a variety of electronics and industrial applications.
 - XG SiG[™] Silicon-graphene composite anode materials for lithium-ion batteries.
 - Custom formulated inks and coatings designed to take advantage of the special properties of our graphene nanoplatelets in targeted customer applications.
 - XG TIM[™] thermal interface materials in the form of greases and pastes targeting a range of thermal management applications in light emitting diode and semiconductor packaging.
 - GNP[™] cement additive package offering tougher, longer lasting cement for commercial and retail applications.
- Established sales distributors in Japan, South Korea, Taiwan, Italy, Germany and China.
- Completed a research contract from the US Air Force for high energy-density ultra-capacitors.
- Won a competition that resulted in a research contract from the U.S. Department of Energy (“DOE”) for ongoing development of high-capacity anode materials for electric vehicles based on the Company’s SiG material. Secured an additional \$1.0 million grant from the DOE for further research into silicon graphene. Collaborated with Oak Ridge National Laboratory to explore metal-matrix materials using xGnP[®] graphene nanoplatelets to modify the properties of metals like titanium.
- Was recognized as a world leader in the graphene market space by Lux Research and named one of the “Top Ten Innovative Companies” profiled by Lux for two years in a row.
- In March 2015 was named a “Michigan 50 Companies to Watch” by Michigan Celebrates Small Businesses.
- Hired Dr. Philip L. Rose as CEO. Prior to joining XGS, Dr. Rose was President of SAFC Hitech, a \$100 million division of Sigma-Aldrich Corporation that makes precursors and performance materials for the LED, energy and display, and semiconductor markets.
- In June 2016, we were awarded a new \$150,000, nine month, DOE Phase I SBIR grant to develop and demonstrate a composite anode material that delivers improved capacity retention during full Lithium-ion battery charge to further the nation’s energy strategy to reduce reliance on fossil fuels and improve the environment.

Our Financing History

Since our inception, we have incurred annual losses every year and have accumulated a deficit from operations of \$(48,899,530) through December 31, 2016 and \$(43,371,368) through December 31, 2015. As of December 31, 2016 and December 31, 2015, our total stockholder's deficit was \$(5,126,864) and \$(4,071,624), respectively.

In 2013 and 2014, we issued and sold approximately \$13.7 million of convertible notes to four investors. These convertible notes, as amended, were mandatorily convertible into Series A Convertible Preferred Stock ("Series A Preferred Stock") at the earlier of the date on which the Company raised \$12 million from disinterested third parties or December 31, 2015. All of the convertible notes plus accrued interest thereon were converted into 1,456,126 shares of Series A Preferred Stock on December 31, 2015. The Series A Preferred Stock is convertible into common stock at the lower of: (a) \$12.00 per share, or (b) 80% of the price at which XGS sells any equity or equity-linked securities in the future while such Series A Convertible Preferred Stock is outstanding. The current conversion rate is \$6.40 per share. We also issued and sold another 112,107 shares of Series A Preferred Stock for \$1.3 million pursuant to certain pre-emptive rights.

In April 2015, we commenced a private placement offering of up to \$18,000,000 in Series B Units consisting of up to 1,125,000 shares of Series B convertible preferred stock ("Series B Preferred Stock") and warrants to purchase common stock (the "Warrants") at an offering price of \$16.00 per Unit. The offering terminated on August 31, 2015 and as of such date, we had sold 269,987 shares of Series B Preferred Stock and Warrants to purchase 224,987 shares of common stock, for aggregate gross proceeds of \$4,319,792.

The Series B Preferred Stock had a stated value of \$16.00 per share and was convertible, at the option of the holder into common shares, at a conversion price of \$16.00 per share, subject to adjustments for stock dividends, splits, combinations and similar events. The Warrants have an exercise price of \$16.00 per share and expire 7 years from issuance. Pursuant to the Certificate of Designation for the Series B Preferred Stock, as amended, during the period from closing of the offering and ending on the earlier of i) December 31, 2017 and ii) the date the Company consummates the sale of new securities resulting in gross proceeds of at least \$18,000,000, each holder had the right to exchange the Series B Preferred Stock into any future equity or equity-linked securities sold by the Company (excluding options and warrants) sold to third parties at the same relative price per share and other terms at which such new security is sold to such third parties (the "Series B Exchange Rights"). As a result of our ongoing IPO (as described below) and pursuant to the Series B Exchange Rights, holders of Series B Preferred Stock received the right to exchange each share of Series B Preferred Stock they owned into two shares of common stock. As of December 31, 2016, all holders of Series B Preferred Stock had exercised their Series B Exchange Rights, and as a result the Company issued 539,974 shares of restricted common stock in exchange for the 269,987 shares of Series B Preferred Stock that had been previously outstanding. All of the Series B Preferred Stock was cancelled. However, all of the Warrants issued in connection with the Series B Units remain outstanding.

From December 31, 2015 through April 7, 2016, we entered into private placement bridge financings with 15 investors, seven of whom are board members or affiliates of board members, totaling \$1,124,750 (the "Bridge Financings"). The investors in the Bridge Financings received common stock warrant coverage of 30% for investments made prior to December 31, 2015 with an exercise price of \$8.00 per share, and 20% coverage thereafter with an exercise price of \$10.00 per share. In June of 2016, we repaid outstanding principal of \$750,000 plus accrued interest of \$27,032 to the Bridge Financing Investors. In December of 2016, we repaid the remaining \$374,750 of outstanding principal plus accrued interest of \$21,253. Members of the board of directors and their affiliates provided \$800,000 of the principal for such Bridge Financings, and upon repayment immediately re-invested all of the principal plus an additional \$1,013,032 to purchase 226,629 shares of our common stock in the IPO.

In December 2016, we entered into a draw loan note and agreement (the “Dow Facility”) with The Dow Chemical Company (“Dow”) to provide up to \$10 million of secured debt financing to the Company at an interest rate of 5% per annum, drawable upon the Company’s request under certain conditions. We received the first \$2 million at closing, with \$3 million in additional financing available until December 1, 2017. After December 1, 2017, an additional \$5 million becomes available if the Company has raised \$10 million of equity capital after October 31, 2016. The loan does not mature until December 1, 2021, (subject to certain mandatory prepayments based on the Company’s equity financing activities), and we may elect to capitalize interest through January 1, 2019. Dow will receive warrant coverage of one share of common stock for each \$40 received by us, equating to 20% warrant coverage, with an exercise price of \$8.00 per share for the warrants issued at closing with the exercise price of future warrants subject to adjustment if we sell shares of common stock at a lower price. As of December 31, 2016, we have issued 50,000 warrants to Dow.

During 2016, we issued 28,560 shares of Series A Preferred Stock to Aspen Advanced Opportunity Fund as payment for lease financing obligations.

We filed a Registration Statement on Form S-1 (File No. 333-209131) with the SEC on April 11, 2016 which was declared effective by the SEC on April 13, 2016 (the “IPO Registration Statement”). The IPO Registration Statement registered up to 3,000,000 shares of common stock at a fixed price of \$8.00 per share to the general public in a self-underwritten, best efforts offering (the “IPO”). The IPO Registration Statement declared effective April 13, 2016 was amended with Post-Effective Amendment No. 1 declared effective August 26, 2016, Post-Effective Amendment No. 2 declared effective August 31, 2016 and Post-Effective Amendment No. 3 declared effective January 17, 2017. As of December 31, 2016 and March 14, 2017, the Company has sold 508,657 and 560,007 shares under the IPO Registration Statement at a price of \$8.00 per share for proceeds of \$4,069,255 and \$4,480,056 respectively.

As of December 31, 2016, we had cash on hand of \$1,785,343 and at March 28, 2017 cash on hand of \$1,138,157 and currently available funds of \$3,000,000 under the Dow Facility, which we believe is sufficient to fund our operations through October 2017. We believe that we will need an additional approximately \$1 million to sustain us for the next 12 months for which we have a commitment from a shareholder. Our financial projections show that we may need to raise an additional \$15 million or more before we are capable of achieving sustainable cash flow from operations. We intend that the primary means for raising such funds will be through our IPO, the additional \$3 million of currently available funds under the Dow Facility, and up to an additional \$5 million of proceeds from the Dow Facility after we have raised \$10 million of additional equity capital in the period beginning on November 1, 2016. There can be no assurance that we will be able to raise additional equity capital in the IPO or in subsequent equity offerings or that the terms and conditions of any future financings will be workable or acceptable to us and our stockholders.

As a result of the Bridge Financings and the IPO, the conversion price of our Series A Preferred Stock was adjusted to \$6.40 per share.

Pursuant to the Certificates of Designation for the Series A, as amended, all then-outstanding shares of Series A will automatically convert into shares of common stock upon the listing of the Company’s common stock on a Qualified National Exchange (a securities exchange registered with the SEC under Section 6(a) of the Securities Exchange Act of 1934, as amended (“Exchange Act”), such as the NASDAQ Capital Market or the New York Stock Exchange, or (ii) the quotation of our common stock on the OTCQB or OTCQX marketplaces operated by OTC Markets Group, Inc. (“OTC Markets”), and the act of achieving such listing or quotation, generally referred to hereafter as a “Public Listing” in this report). As a result, there will only be one class of equity securities outstanding — common stock — after we achieve a Public Listing. Prior to any such listing, the Series A may be voluntarily converted into shares of common stock at the then-current conversion rate (current rate for the Series A Preferred Stock is 1.875 for 1).

Public Listing

In order to achieve a Public Listing (as defined above), we will have to meet certain initial listing qualifications of the Qualified National Exchange on which we are seeking the Public Listing. In addition, we will need to have market makers agree to make a market in our common stock and file a FINRA Form 15c211 with the SEC on our behalf before we can achieve a Public Listing, and we will also need to remain current in our quarterly and annual filings with the SEC. Although we intend to seek a Public Listing in 2017, we cannot make any assurances that our common stock will ever be quoted or traded on Qualified National Exchange or that any market for our common stock will develop.

Employees

As of December 31, 2016 we had 22 full-time employees and 1 part-time employee. Employees include the following four senior managers that report to the CEO: Vice President of Operations, Vice President of Energy Markets, Vice President of Research & Development, and Controller. The Company employs a total of 6 full-time scientists and technicians in its R&D group, including the Vice President of Research & Development.

Corporate Information

XG Sciences, Inc. was incorporated on May 23, 2006 in the State of Michigan and is organized as a “C” corporation under the applicable laws of the United States and State of Michigan. We do not currently have any affiliated companies or joint venture partners, and we have one wholly-owned subsidiary called XG Sciences IP, LLC. This subsidiary was created in 2014 for the purpose of holding our intellectual property. Our headquarters and principal executive offices are located at 3101 Grand Oak Drive, Lansing, Michigan, 48911 and our telephone number is (517) 703-1110.

Our website address is <http://www.xgsciences.com>, although the information contained in, or that can be accessed through, our website is not part of this filing. You may also contact Dr. Philip L. Rose, our Chief Executive Officer via email at p.rose@xgsciences.com.

ITEM 1A. RISK FACTORS

Risks Relating to Our Business and Industry

We are a young company with a limited operating history, making it difficult for you to evaluate our business and your investment.

XG Sciences, Inc. was incorporated on May 23, 2006. We have not yet demonstrated sales of products at a level capable of covering our fixed expenses. Since inception, we have not demonstrated the capability to produce sufficient materials to generate the ongoing revenues necessary to sustain our operations in the long-term. Nor have we demonstrated the ability to generate sufficient sales to sustain the business. There can be no assurance that we will ever produce a profit.

Many of our products represent new products that have not yet been fully developed and for which manufacturing operations have not yet been fully scaled. This means that investors are subject to all the risks incident to the creation and development of multiple new products and their associated manufacturing processes, and each investor should be prepared to withstand a complete loss of their investment.

Because we are subject to these uncertainties, there may be risks that management has failed to anticipate and you may have a difficult time evaluating our business and your investment in our Company. Our ability to become profitable depends primarily on our ability to successfully commercialize our products in the future. Even if we successfully develop and market our products, we may not generate sufficient or sustainable revenue to achieve or sustain profitability, which could cause us to cease operations and you will lose all of your investment.

We have no sustainable base of products approved for commercial use by our customers, have never generated significant product revenues and may never achieve sufficient revenues for profitable operations, which could cause us to cease operations.

XG Sciences primarily sells bulk materials or products made with these materials to other companies for incorporation into their products. To date, there has been no significant incorporation of our materials or products into customer products that are released for commercial sale. Because there is no demonstrated history of commercial success for our products, it is possible that such commercial success may never happen and that we will never achieve the level of revenues necessary to sustain our business.

We currently have an accumulated deficit and a stockholders' deficit

As of December 31, 2016 and December 31, 2015, we have an accumulated deficit from operations of \$(48,899,530) and \$(43,371,368), respectively. As of December 31, 2016 and December 31, 2015, our total stockholder's deficit was \$(5,126,864) and \$(4,071,624), respectively. The deficit reflects net losses in each period since our inception incurred through development of nanomaterials without the presence of a large-scale market to generate substantial revenues to cover development costs and generate a profit. We have never paid a dividend.

Investing in a Company with a current deficit involves risk, as the Company needs to raise capital to continue funding operations. We cannot guarantee that we will be able to raise the capital to continue operating at the current deficit or that the revenue from operations and the value of our assets will increase enough to eliminate the deficit.

We will need to raise substantial additional capital in the future to fund our operations and we may be unable to raise such funds when needed and on acceptable terms, which could have a materially adverse effect on our business.

Developing, manufacturing and selling nanomaterials in commercially-viable quantities requires substantial funding. From December 31, 2015 through April 7, 2016, we entered into private placement bridge financings with 14 investors, seven of whom are board members or affiliates of board members, totaling \$1,124,750 (the "Bridge Financings"). The investors in the Bridge Financings received common stock warrant coverage of 30% for investments made prior to December 31, 2015 with an exercise price of \$8.00 per share, and 20% coverage thereafter with an exercise price of \$10.00 per share. During June 2016, we repaid outstanding principal of \$750,000 plus accrued interest of \$27,032 to the Bridge Financing Investors. During December 2016, we repaid the remaining \$374,750 of outstanding principal plus accrued interest of \$21,253. Members of the board of directors and their affiliates provided \$800,000 of the principal for such Bridge Financings, and upon repayment immediately re-invested all of the principal plus an additional \$1,013,032 to purchase 226,629 shares of the Company's common stock in our IPO.

As of December 31, 2016, we had cash on hand of \$1,785,343 and at March 28, 2017 cash on hand of \$1,138,157 and currently available funds of \$3,000,000 under the Dow Facility, which we believe is sufficient to fund our operations through October 2017. We believe that we will need approximately \$1 million to sustain us for the next 12 months for which we have a commitment from a shareholder. Our financial projections show that we may need to raise an additional \$15 million or more before we are capable of achieving sustainable cash flow from operations. We intend that the primary means for raising such funds will be through our IPO, the additional \$3 million of currently available funds under the Dow Facility, and up to an additional \$5 million of proceeds from the Dow Facility after we have raised an additional \$10 million of equity capital in the period beginning on November 1, 2016. As of December 31, 2016 and March 14, 2017, the Company has sold 508,657 and 560,007 shares under the IPO Registration Statement at a price of \$8.00 per share for proceeds of \$4,069,255 and \$4,480,056 respectively. There can be no assurance that we will be able to raise additional equity capital in our IPO or in subsequent equity offerings or that the terms and conditions of any future financings will be workable or acceptable to us and our stockholders.

In the event that we are not able to raise substantial additional funds in the future on terms that are acceptable or adjust our business model accordingly, we may be forced to curtail or cease operations and you could lose all or a significant part of your investment.

Additionally, the second \$5 million under the Dow Facility will only become available to us after we have raised \$10 million of equity capital. There is no assurance that we will be able to raise the necessary equity capital in order to access this \$5 million and as a result we could lose access to the Dow Facility as a source of further capital.

If we are unable to continue as a going concern, our securities will have little or no value.

We currently anticipate that our cash and cash equivalents and availability under the Dow Facility will be sufficient to fund our operations through October 2017, without raising additional capital. We believe that we will need approximately an additional \$1 million to sustain us for the next 12 months for which we have a commitment from a shareholder. Our continuation as a going concern is dependent upon continued financial support from our shareholders, our ability to obtain necessary equity and/or debt financing to continue operations, and the attainment of profitable operations. We cannot make any assurances that additional financings will be available to us and, if available, completed on a timely basis, on acceptable terms or at all. If we are unable to complete an equity or debt offering, or otherwise obtain sufficient financing when and if needed, it would negatively impact our business and operations, which would likely cause the price of our common stock to decline. It could also lead to the reduction or suspension of our operations and ultimately force us to cease our operations.

We have limited experience in the higher volume manufacturing that will be required to support profitable operations, and the risks associated with scaling to larger production quantities may be substantial.

We have limited experience manufacturing our products. We have established small-scale commercial or pilot-scale production facilities for our bulk powders, thermal interface materials (“XG TIM™” or TIM), XG Leaf® and SiG materials, but these facilities do not have the existing production capacity to produce sufficient quantities of materials for us to reach sustainable sales levels. In order to develop the capacity to produce much higher volumes, it will be necessary to produce multiples of existing processes or engineer new production processes in some cases. There is no guarantee that we will be able to economically scale-up our production processes to the levels required. If we are unable to scale-up our production processes and facilities to support sustainable sales levels, the Company may be forced to curtail or cease operations and you could lose all or a significant part of your investment.

Projection of fixed monthly expenses and operating losses for the near future means that investors may not earn a return on their investment or may lose all of their investment.

Because of the nature of our business, we project considerable fixed expenses that will lead to projected monthly deficits for the near future. Fixed manufacturing expenses to maintain production facilities, compensation expenses for scientists and other critical personnel, and ongoing rent and utilities amount to several hundred thousand dollars per month, and we believe that such expenses are required as a precursor to significant customer sales. However, there can be no assurance that monthly sales will ever reach a sufficient level to cover the cost of ongoing monthly expenses. If sufficient regular monthly sales are not generated to cover these fixed expenses, we will continue to experience monthly profit deficits which, if not eliminated, will require continuing new investment in the Company. If monthly deficits continue beyond levels that investors find tolerable, we may not be able to raise additional funds and may be forced to curtail or cease operations and you could lose all or a significant part of your investment.

We have a long and complex sales cycle and have not demonstrated the ability to operate successfully in this environment.

It has been our experience since our inception that the average sales cycle for our products can range from one to seven years from the time a customer begins testing our products until the time that they could be successfully used in a commercial product. The product introduction timing will vary based on the target market, with automotive uses typically being toward the long end and consumer electronics toward the shorter end. We have not demonstrated a track record of success in completing customer development projects, which makes it difficult for you to evaluate the likelihood of our future success. The sales and development cycle for our products is subject to customer budgetary constraints, internal acceptance procedures, competitive product assessments, scientific and development resource allocations, and other factors beyond our control. If we are not able to successfully accommodate these factors to enable customer development success, we will be unable to achieve sufficient sales to reach profitability. In this case, we may not be able to raise additional funds and may be forced to curtail or cease operations and you could lose all or a significant part of your investment.

We could be adversely affected by our exposure to customer concentration risk.

We are subject to customer concentration risk as a result of our reliance on a relatively small number of customers for a significant portion of our revenues. For 2016 we had one customer (one of our licensees) whose purchases account for 24% of product revenue and in 2015 we had one customer (one of our Asian distributors) whose purchases accounted for 9% of total product revenues. In 2014, one of our licensees represented 69% of total product revenues. Due to the nature of our business and the relatively large size of many of the applications our customers are developing, we anticipate that we will be dependent on a relatively small number of customers for the majority of our revenues for the next several years. It is possible that only one or two customers could place orders sufficient to utilize most or all of our existing manufacturing capacity.

In this case, there would be a risk of significant loss of future revenues if one or more of these customers were to stop ordering our materials, which could in turn have a material adverse effect on our business and on your investment.

Our revenues often fluctuate significantly based on one-off orders from customers or from the recognition of grant revenues which vary from period-to-period, which may materially impact our financial results from period to period.

Because of the potential for large revenue swings from one-time large orders or grants it may be difficult to accurately forecast the needs for inventory, working capital, and other financial resources from period-to-period. Such orders would require a significant short-term increase in our production capacity and would require the financial resources to add staff and support the associated working capital. If such large one-time orders were not handled smoothly, customer confidence in us as a viable supplier could be reduced and we might not succeed in capturing the additional larger orders that may be reflected in our business plan.

We operate in an advanced technology arena where hypothesized properties and benefits of our products may not be achieved in practice, or in which technological change may alter the attractiveness of our products.

Because there is no sustained history of successful use of our products in commercial applications, there is no assurance that broad successful commercial applications may be technically feasible. Most, if not all, of the scientific and engineering data related to our products has been generated in our own laboratories or in laboratory environments at our customers or third-parties, like universities and national laboratories. It is well known that laboratory data is not always representative of commercial applications.

Likewise, we operate in a market that is subject to rapid technological change. Part of our business strategy is to monitor such change and take steps to remain technologically current, but there is no assurance that such strategy will be successful. If we are not able to adapt to new advances in materials sciences, or if unforeseen technologies or materials emerge that are not compatible with our products and services or that could replace our products and services, our revenues and business prospects would likely be adversely affected. Such an occurrence may have severe consequences, including the potential for our investors to lose all or a significant part of their investment.

Competitors that are larger and better funded may cause the Company to be unsuccessful in selling its products.

The Company operates in a market that is expected to have significant competition in the future. Global research is being conducted by substantially larger companies who have greater financial, personnel, technical, and marketing resources. There can be no assurance that our strategy of offering better materials based on our proprietary exfoliated graphite nanoplatelets will be able to compete with other companies, many of whom will have significantly greater resources, on a continuing basis. In the event that we cannot compete successfully, we may be forced to cease operations and investors may lose all or a significant part of their investment.

Because of our small size and limited operating history, we are dependent on key employees.

Our operations and development are dependent upon the experience and knowledge of Philip L. Rose, our Chief Executive Officer. If he was to resign or be terminated, our business would be adversely affected in the short term, and his departure could disrupt the business enough to endanger your investment. We also depend on Dr. Liya Wang, Vice President of Research & Development, Robert Privette, Vice President of Energy Markets, Scott Murray, Vice President of Operations, and Dr. Hiroyuki Fukushima, Technical Director. If the services of any of these individuals should become unavailable, our business operations might be adversely affected. We do not hold any "Key Person" insurance, and if several of these individuals became unavailable at the same time, our ability to continue normal business operations might be adversely affected to the extent that revenue or profits could be diminished and you could lose all or a significant part of your investment.

Our success depends in part on our ability to protect our intellectual property rights, and our inability to enforce these rights could have a material adverse effect on our competitive position.

We rely on the patent, trademark, copyright and trade-secret laws of the United States and the countries where we do business to protect our intellectual property rights. We may be unable to prevent third parties from using our intellectual property without our authorization. The unauthorized use of our intellectual property could reduce any competitive advantage we have developed, reduce our market share or otherwise harm our business. In the event of unauthorized use of our intellectual property, litigation to protect or enforce our rights could be costly, and we may not prevail.

Many of our technologies are not covered by any patent or patent application, and our issued and pending U.S. and non-U.S. patents may not provide us with any competitive advantage and could be challenged by third parties. Our inability to secure issuance of our pending patent applications may limit our ability to protect the intellectual property rights these pending patent applications were intended to cover. Our competitors may attempt to design around our patents to avoid liability for infringement and, if successful, our competitors could adversely affect our market share. Furthermore, the expiration of our patents may lead to increased competition.

Our pending trademark applications may not be approved by the responsible governmental authorities and, even if these trademark applications are granted, third parties may seek to oppose or otherwise challenge these trademark applications. A failure to obtain trademark registrations in the United States and in other countries could limit our ability to protect our products and their associated trademarks and impede our marketing efforts in those jurisdictions.

In addition, effective patent, trademark, copyright and trade secret protection may be unavailable or limited in some foreign countries. In some countries, we do not apply for patent, trademark or copyright protection. We also rely on unpatented proprietary manufacturing expertise, continuing technological innovation and other trade secrets to develop and maintain our competitive position. Although we generally enter into confidentiality agreements with our employees and third parties to protect our intellectual property, these confidentiality agreements are limited in duration and could be breached, and may not provide meaningful protection of our trade secrets or proprietary manufacturing expertise. Adequate remedies may not be available if there is an unauthorized use or disclosure of our trade secrets and manufacturing expertise. In addition, others may obtain knowledge about our trade secrets through independent development or by legal means. The failure to protect our processes, apparatuses, technology, trade secrets and proprietary manufacturing expertise, methods and compounds could have a material adverse effect on our business by jeopardizing critical intellectual property.

Where a product formulation or process is kept as a trade secret, third parties may independently develop or invent and patent products or processes identical to our trade-secret products or processes. This could have an adverse impact on our ability to make and sell products or use such processes and could potentially result in costly litigation in which we might not prevail.

We could face intellectual property infringement claims that could result in significant legal costs and damages and impede our ability to produce key products, which could have a material adverse effect on our business, financial condition and results of operations.

If we fail to maintain effective internal controls over financial reporting, the price of our common stock may be adversely affected.

We are required to establish and maintain appropriate internal controls over financial reporting. Failure to establish those controls, or any failure of those controls once established, could adversely impact our public disclosures regarding our business, financial condition or results of operations. Any failure of these controls could also prevent us from maintaining accurate accounting records and discovering accounting errors and financial frauds. Rules adopted by the SEC pursuant to Section 404 of the Sarbanes-Oxley Act of 2002 require annual assessment of our internal control over financial reporting, and the standards that must be met for management to assess the internal control over financial reporting as effective are new and complex, and require significant documentation, testing and possible remediation to meet the detailed standards. We may encounter problems or delays in completing activities necessary to make an assessment of our internal control over financial reporting. If we cannot assess our internal control over financial reporting as effective, investor confidence and share value may be negatively impacted.

In addition, management's assessment of internal controls over financial reporting may identify weaknesses and conditions that need to be addressed in our internal controls over financial reporting or other matters that may raise concerns for investors. Any actual or perceived weaknesses and conditions that need to be addressed in our internal control over financial reporting, disclosure of management's assessment of our internal controls over financial reporting, or disclosure of our independent registered public accounting firm's report on management's assessment of our internal controls over financial reporting may have an adverse impact on the price of our common stock.

Future adverse regulations could affect the viability of the business.

Our bulk products have been approved for sale in the United States by the U.S. Environmental Protection Agency after a detailed review of our products and production processes for our H, M and C grade materials. In most cases, as far as we are aware, there are no current regulations elsewhere in the world that prevent or prohibit the sale of our products. Nevertheless, the sale of nano-materials is a subject of regulatory discussion and review in many countries around the world. In some cases, there is a discussion of potential testing requirements for toxicity or other health effects of nano-materials before they can be sold in certain jurisdictions. If such regulations are enacted in the future, our business could be adversely affected because of the requirement for expensive and time-consuming tests or other regulatory compliance. There can be no assurance that future regulations might not severely limit or even prevent the sale of our products in major markets, in which case our financial prospects might be severely limited, causing investors to lose all or a significant part of their investment.

Compliance with changing regulation of corporate governance and public disclosure will result in additional expenses and will divert time and attention away from revenue generating activities.

Changing laws, regulations and standards relating to corporate governance and public disclosure, including the Sarbanes-Oxley Act of 2002 and related SEC regulations, have created uncertainty for public companies and significantly increased the costs and risks associated with accessing the public markets and public reporting. Our management team will need to invest significant management time and financial resources to comply with both existing and evolving standards for public companies, which will lead to increased general and administrative expenses and a diversion of management time and attention from revenue generating activities to compliance activities, which could have an adverse effect on our business.

Risks Relating To Our Common Stock

There is a risk of dilution of your percentage ownership of common stock in the Company.

In addition to the shares which we may sell pursuant to our IPO, we have the right to raise additional capital or incur borrowings from third parties to finance its business. We may also implement public or private mergers, business combinations, business acquisitions and similar transactions pursuant to which we would issue substantial additional capital stock to outside parties, causing substantial dilution in the ownership of the Company by our existing stockholders. Subject to certain exceptions (See "Management — Shareholder Side Letter"), our Board of Directors has the authority, without the consent of any of the stockholders, to cause the Company to issue more shares of common stock and/or preferred stock at such price and on such terms and conditions as are determined by the Board in its sole discretion.

The sale of the shares being offered by us in our IPO, as well as the shares of common stock issuable upon the exercise of options and warrants, the shares issuable upon conversion of Series A Preferred Stock (including the shares of Series A Preferred Stock issuable upon the exercise of warrants) and the issuance of additional shares of capital stock by us will dilute your ownership percentage in the Company and could impair our ability to raise capital in the future through the sale of equity securities.

Certain stockholders who are also officers and directors of the Company may have significant control over our management, which may not be in your best interests.

As of December 31, 2016, the directors, or the entities they represent, and executive officers of the Company owned approximately 64.5% of the voting stock of the Company. Certain of these executives and directors, or the companies they represent, converted secured convertible notes into an additional 1,383,900 shares of Series A Preferred Stock on December 31, 2015.

Additionally, our existing stockholders are a party to that certain Shareholder Agreement dated March 3, 2017 (the "Shareholder Agreement"). Although shareholders purchasing shares in our IPO will not be subject to the Shareholder Agreement, certain provisions of such Shareholder Agreement may impact the governance of the Company. Pursuant to the Shareholder Agreement, (a) so long as AAOF or its affiliates own 10% of more of the aggregate outstanding Shareholder Stock (as defined in the Shareholder Agreement), (i) the size of the Board of Directors shall be set at seven individuals (provided, however, that the number of directors on the Board of Directors may be increased or decreased with the prior written consent of AAOF and shareholders (including AAOF) who in the aggregate then own Shareholder Stock representing a majority of the then issued and outstanding voting stock of the Company), (ii) one person nominated by AAOF shall be elected to the Board of Directors, (iii) two members of the Board of Directors, other than those nominated by AAOF, POSCO or Hanwha Chemical, shall qualify as independent Directors; (b) so long as POSCO owns 10% of more of the aggregate outstanding Shareholder Stock, one person nominated by POSCO shall be elected to the Board of Directors (POSCO does not currently own 10% or more of the aggregate outstanding Shareholder Stock and therefore does not maintain a seat on our Board of Directors); and (c) so long as Hanwha Chemical owns 10% of more of the aggregate outstanding Shareholder Stock, one person nominated by Hanwha Chemical shall be elected to the Board of Directors (Hanwha does not currently own 10% or more of the aggregate outstanding Shareholder Stock and therefore does not maintain a seat on our Board of Directors).

The Shareholder Agreement contains certain restrictions on transfer. Pursuant to the Shareholder Agreement, the Company has a first right of first refusal with respect to certain stock transfers. In the event that the Company does not exercise this right, each non-transferring shareholder shall have the right to purchase its pro rata share of the transferring shareholder's stock. Subject to certain exclusions such as any offering of shares pursuant to a registration statement declared effective by the SEC, each shareholder who is a signatory to the Shareholder Agreement has a preemptive right to purchase his, her or its pro rata share of the Company's common stock in subsequent offerings. The Shareholder Agreement also contains a right of co-sale and bring-along rights where a shareholder or shareholders owning more than 50% of the Company's common stock on a fully diluted basis may cause other shareholders to tender their shares to a third-party purchaser.

Under the Shareholder Agreement, shareholders may not, while such person is a shareholder, directly or indirectly, either alone or in association with others, in any other capacity: (i) conduct, become engaged or interested in, any business that competes, directly or indirectly, with the business of the Company or any of its affiliates worldwide; (ii) solicit, divert or take away or attempt to solicit, divert or take away, directly or indirectly, any of the Company's or its affiliates current, prior, or prospective customers; or (iii) solicit or attempt to solicit any person who is employed or engaged to perform services by the Company or its affiliates to leave his or her employment or engagement with Company or its Affiliates. After such shareholder ceases to be a shareholder, the former shareholder may not for a period of three (3) years from the date of sale, directly or indirectly, either alone or in association with others, for himself or herself or in any other capacity: (i) conduct, become engaged in, or interested in, any business that competes, directly or indirectly, with the business of the Company or any of its affiliates worldwide; (ii) solicit, divert or take away or attempt to solicit, divert or take away, directly or indirectly, any of the Company's or its affiliates current, prior, or prospective customers; or (iii) solicit or attempt to solicit any person who is employed or engaged to perform services by the Company or its affiliates to leave his or her employment or engagement with Company or its affiliates. These restrictions on competition and solicitation will not be violated, however, by a shareholder's passive ownership of up to 2% of a class of outstanding publicly traded shares of a corporation that is listed or quoted on a national securities exchange including any such corporation that competes with the business of the Company.

On February 26, 2016, the Shareholder Agreement was amended (the “Amendment to the Shareholder Agreement”) to provide that holders of Excluded Stock are not subject to the terms of the Shareholder Agreement. Excluded Stock means shares of common stock that are subject to a registration statement that has been filed with the SEC and has been declared effective, such as the shares sold pursuant to our IPO.

The Amendment to the Shareholder Agreement further clarifies that preemptive rights shall not apply to Excluded Stock, and amends the termination date of the Shareholder Agreement. Specifically, the Shareholder Agreement has been amended to provide that it continues in effect until (i) the date of the closing of a public offering of common stock pursuant to a registration statement filed with the SEC that is declared effective in which the Company receives gross proceeds of at least \$10,000,000, on which date it shall terminate in its entirety, unless the Shareholder Agreement is earlier terminated in accordance with its terms, or (ii) the date on which the Company’s common stock is listed on the NASDAQ Stock Market of the New York Stock Exchange. As a result, in the event that we are unable to raise at least \$10,000,000 in our IPO, the Shareholder Agreement will continue to remain in effect and certain of our larger shareholders will be entitled to continue to exercise their rights under such Shareholder Agreement, but purchasers of shares of common stock under the registration statement filed in connection with our IPO will not be required to adopt the Shareholder Agreement.

Furthermore, in conjunction with a financing from Samsung Ventures on January 15, 2014, we and our existing stockholders entered into a voting agreement with Samsung Ventures whereby for so long as Samsung Ventures owns 10% or more of the aggregate outstanding common stock of XGS (assuming Full Conversion, but excluding any shares of common stock issuable upon the exercise of any warrants held by Samsung Ventures), each stockholder made a party thereto shall vote all of his, her or its voting securities from time to time in whatever manner is necessary to ensure that at each annual or special meeting of the stockholders at which an election of Directors is held or pursuant to any written consent of the stockholders, one person nominated by Samsung Ventures is elected to our Board as a Director. The rights granted to Samsung Ventures under a voting agreement are effective until the first to occur of (1) the date on which the Minimum Ownership Requirement is no longer satisfied, (2) the date on which the Shareholder Agreement (which is described above) is terminated for any reason and (3) the date that Samsung Ventures agrees in writing to terminate the Agreement.

As a result, such entities have a significant influence on the affairs and management of the Company, as well as on all matters requiring stockholder approval, including electing and removing members of our Board of Directors, causing us to engage in transactions with affiliated entities, causing or restricting the sale or merger of the Company, and certain other matters. Such concentration of ownership and control could have the effect of delaying, deferring or preventing a change in control of the Company even when such a change of control would be in the best interests of our stockholders.

We may, in the future, issue additional shares of common stock, which would reduce investors’ percent of ownership and may dilute our share value.

Our Articles of Incorporation, as amended, authorize the issuance of up to 25,000,000 shares of common stock and up to 8,000,000 shares of preferred stock. As of December 31, 2016, the Company had 1,885,175 shares of common stock and 1,829,256 shares of Series A Preferred Stock issued and outstanding.

Upon a Public Listing on a Qualified National Exchange, all Series A Preferred Stock then currently outstanding will automatically convert into shares of common stock at the then-current Series A Conversion Rate (current ratio is 1.875 for 1), which would result in the issuance of 3,429,849 shares of common stock assuming the conversion of all 1,829,256 shares of Series A Preferred Stock. Series A Preferred Stock holders may also voluntarily convert at the then-current rate at any time prior to any such Public Listing on a Qualified National Exchange.

As of December 31, 2016, the Company had also granted options to purchase up to 369,750 shares of common stock and had issued warrants to purchase up to (i) 318,017 shares of common stock, (including the warrants for 50,000 shares issued under the Dow Facility) and (ii) 1,072,720 shares of Series A Preferred Stock which, if exercised, would be convertible into 2,011,345 shares of common stock at the then-current Series A Conversion Rate (currently of 1.875 shares for each share of Series A Preferred Stock). Therefore, we have committed to issue up to an additional 6,128,961 shares of common stock, which includes the issuance of (a) 3,429,849 shares upon conversion of all 1,829,256 shares Series A Preferred Stock currently outstanding at the Series A Conversion Rate, (b) 2,011,345 shares upon the conversion of 1,072,720 shares of Series A Preferred Stock (at the current Series A Conversion Rate) which are issuable upon exercise of 1,072,720 Series A warrants, (c) 369,750 shares upon the exercise of options and (d) the issuance of 318,017 shares upon the exercise of warrants. If we issued all 6,128,961 shares, we would have, including the 1,885,175 shares currently outstanding, 8,014,136 shares issued and outstanding, with 16,985,864 authorized shares available for future issuance, and if we assume the sale of all 2,491,343 shares being offered pursuant to our IPO, we would have 14,494,521 authorized shares available for future issuance. The future issuance of common stock may result in substantial dilution in the percentage of our common stock held by our then existing stockholders. We may value any common stock issued in the future on an arbitrary basis. The issuance of common stock for future services or acquisitions or other corporate actions may have the effect of diluting the value of the shares held by our investors, might have an adverse effect on any trading market for our common stock and could impair our ability to raise capital in the future through the sale of equity securities.

The Dow Facility obligates us to issue a warrant to purchase a share of our common stock for each \$40 in debt drawn. If we choose to draw further funding from the Dow Facility, we will become obligated to issue warrants to purchase up to 200,000 more of our shares depending on the amount drawn. If we issue these warrants, further dilution could occur.

We have a large number of restricted shares outstanding, a portion of which may be sold under Rule 144, which may reduce the market price of our shares.

Our Series A Preferred Stock may be voluntarily converted, or will automatically convert upon a Public Listing of our common shares on a Qualified National Exchange, into shares of common at the then-current Series A Conversion Rate (at the current ratio of 1.875 for 1, all shares of Series A Preferred Stock outstanding at December 31, 2016 would result in an issuance of 3,429,849 shares of common stock).

As of December 31, 2016, of the 1,885,175 shares of common stock issued and outstanding, 353,729 shares of common stock were held by affiliates and 1,531,446 shares of common stock were held by non-affiliates. Of the 5,315,024 shares of common stock that would be issued and outstanding on a fully diluted basis assuming (i) (the conversion of all 1,829,256 shares of Series A Preferred Stock into 3,429,849 shares of common stock and (ii) no warrants or stock options are converted or exercised, 1,886,543 shares of common stock would be held by non-affiliates and 3,428,481 shares of common stock would be held by affiliates of the Company. All of such shares, with the exception of shares sold pursuant to our IPO, are deemed “restricted securities” within the meaning of Rule 144 as promulgated under the Securities Act.

It is anticipated that all of the aforementioned “restricted securities” will be eligible for resale under Rule 144. In general, under Rule 144, subject to the satisfaction of certain other conditions, a person, who is not an affiliate (and who has not been an affiliate for a period of at least three months immediately preceding the sale) and who has beneficially owned restricted shares of our common stock for at least six months is permitted to sell such shares without restriction, provided that there is sufficient public information about us as contemplated by Rule 144. An affiliate who has beneficially owned restricted shares of our common stock for a period of at least one year may sell a number of shares equal to one percent of our issued and outstanding common stock approximately every three months.

The possibility that substantial amounts of our common stock may be sold under Rule 144 into the public market may adversely affect prevailing market prices for the common stock and could impair our ability to raise capital in the future through the sale of equity securities.

We are considered a smaller reporting company and are exempt from certain disclosure requirements, which could make our stock less attractive to potential investors.

Rule 12b-2 of the Exchange Act defines a “smaller reporting company” as an issuer that is not an investment company, an asset-backed issuer, or a majority-owned subsidiary of a parent that is not a smaller reporting company and that:

- Had a public float of less than \$75 million as of the last business day of its most recently completed second fiscal quarter, computed by multiplying the aggregate worldwide number of shares of its voting and non-voting common equity held by non-affiliates by the price at which the common equity was last sold, or the average of the bid and asked prices of common equity, in the principal market for the common equity; or
- In the case of an initial registration statement under the Securities Act or Exchange Act for shares of its common equity, had a public float of less than \$75 million as of a date within 30 days of the date of the filing of the registration statement, computed by multiplying the aggregate worldwide number of such shares held by non-affiliates before the registration plus, in the case of a Securities Act registration statement, the number of such shares included in the registration statement by the estimated public offering price of the shares; or
- In the case of an issuer whose public float as calculated under paragraph (1) or (2) of this definition was zero, had annual revenues of less than \$50 million during the most recently completed fiscal year for which audited financial statements are available.

As a “smaller reporting company” (in addition to and without regard to our status as an “emerging growth company”) we are not required and may not include a “Compensation Discussion and Analysis” section in our proxy statements; we provide only 3 years of business development information; provide fewer years of selected financial data; and have other “scaled” disclosure requirements that are less comprehensive than issuers that are not “smaller reporting companies” which could make our stock less attractive to potential investors, which could make it more difficult for you to sell your shares.

We are considered an “emerging growth company” and we cannot be certain if the reduced disclosure requirements applicable to emerging growth companies will make our common stock less attractive to investors.

We are an “emerging growth company,” as defined in the Jumpstart our Business Startups Act of 2012, and we may take advantage of certain exemptions from various reporting requirements that are applicable to other public companies, including, but not limited to, not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act, reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements, and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved.

We will remain an emerging growth company until the earlier of (i) the last day of the fiscal year (A) following the fifth anniversary of our first sale of common equity securities pursuant to an effective registration statement, (B) in which we have total annual gross revenue of at least \$1.0 billion, or (C) the date that we become a “large accelerated filer” as defined in Rule 12b-2 under the Exchange Act, which would occur if the market value of our common stock that is held by non-affiliates exceeds \$700 million as of the last business day of our most recently completed second fiscal quarter, and (ii) the date on which we have issued more than \$1.0 billion in non-convertible debt during the prior three-year period.

We cannot predict if investors will find our common stock less attractive because we may rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our stock price may be more volatile when trading occurs.

We are subject to the periodic reporting requirements of the Exchange Act, which will require us to incur audit fees and legal fees in connection with the preparation of such reports. These additional costs will negatively affect our ability to earn a profit.

As a result of going effective on the IPO Registration Statement on April 13, 2016, we are now required to file periodic reports with the Securities and Exchange Commission pursuant to the Exchange Act and the rules and regulations thereunder. In order to comply with such requirements, our independent registered auditors will have to review our financial statements on a quarterly basis and audit our financial statements on an annual basis. Moreover, our legal counsel will have to review and assist in the preparation of such reports. Factors such as the number and type of transactions that we engage in and the complexity of our reports cannot accurately be determined at this time and may have a major negative effect on the cost and amount of time to be spent by our auditors and attorneys. However, the incurrence of such costs will be an expense to our operations and thus have a negative effect on our ability to meet our overhead requirements and earn a profit.

However, for as long as we remain an “emerging growth company” we intend to take advantage of certain exemptions from various reporting requirements until we are no longer an “emerging growth company.”

We also qualify as a smaller reporting company, and so long as we remain a smaller reporting company, we benefit from many of the same exemptions and exclusions as an emerging growth company. In the event that we cease to be an emerging growth company as a result of a lapse of the five-year period, but continue to be a smaller reporting company, we would continue to be subject to the exemptions available to emerging growth companies until such time as we were no longer a smaller reporting company.

After, and if ever, we are no longer an “emerging growth company,” we expect to incur significant additional expenses and devote substantial management effort toward ensuring compliance with those requirements applicable to companies that are not “emerging growth companies,” including Section 404 of the Sarbanes-Oxley Act.

For so long as we are an emerging growth company, we may rely on certain exemptions provided in the JOBS Act, including reduced disclosure regarding executive compensation, not seeking an advisory vote with respect to executive compensation and not requiring our independent registered public accounting firm to attest to the effectiveness of our internal control over financial reporting, which could make our common stock less attractive to investors due to the nature of the reduced disclosure.

We are an “emerging growth company,” as defined in the JOBS Act, and may remain an emerging growth company for up to five years. For so long as we remain an emerging growth company, we are permitted and plan to rely on exemptions from certain disclosure requirements that are applicable to other public companies that are not emerging growth companies. These exemptions include not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002, or SOX Section 404, not being required to comply with any requirement that may be adopted by the Public Company Accounting Oversight Board regarding mandatory audit firm rotation or a supplement to the auditor’s report providing additional information about the audit and the financial statements, reduced disclosure obligations regarding executive compensation and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved. In this Annual Report on Form 10-K, we have provided only two years of audited financial statements and have not included all of the executive compensation related information that would be required if we were not an emerging growth company. We cannot predict whether investors will find our common stock less attractive if we rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our stock price may be more volatile. In addition, the JOBS Act provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards. This allows an emerging growth company to delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. We have irrevocably elected not to avail ourselves of this exemption from new or revised accounting standards and, therefore, we will be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies.

If securities or industry analysts do not publish research or reports or publish unfavorable research about our business, the price and trading volume of our common stock could decline.

Upon a Public Listing, the trading market for our common stock will depend in part on the research and reports that securities or industry analysts publish about us or our business. We do not currently have and may never obtain research coverage by securities and industry analysts. If no securities or industry analysts commence coverage of us, the trading price for our common stock and other securities would be negatively affected. In the event that we obtain securities or industry analyst coverage, if one or more of the analysts who covers us downgrades our securities, the price of our securities would likely decline. If one or more of these analysts ceases to cover us or fails to publish regular reports on us, interest in the purchase of our securities could decrease, which could cause the price of our common stock and other securities and their trading volume to decline.

If our common stock becomes a “penny stock,” you may have greater difficulty selling your shares.

Penny stocks are generally equity securities with a 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 quotation system. After a Public Listing, our common stock may become a “penny stock” within the meaning of the rules, the rules apply to us and to our securities if we are not listed on a national securities exchange. These rules may further affect the ability of owners of shares to sell our securities in any market that might develop for them. As long as the trading price of our common stock is less than \$5.00 per share, even if our common stock is quoted on either the OTCQX or OTCQB market place operated by the OTC Markets, our common stock will be subject to Rule 15c-9 under the Exchange Act (the “Penny Stock Rules”). 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:

- contains a description of the nature and level of risk in the market for penny stocks in both public offerings and secondary trading;
- 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 to such duties or other requirements of securities laws;
- 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;
- contains a toll-free telephone number for inquiries on disciplinary actions;
- defines significant terms in the disclosure document or in the conduct of trading in penny stocks; and
- 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 statements 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 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 in the secondary market for our stock if it becomes designated as a Penny Stock.

Because we do not intend to pay any cash dividends on our common stock, our stockholders will not be able to receive a return on their shares unless they sell them.

We intend to retain any future earnings to finance the development and expansion of our business. We do not anticipate paying any cash dividends on our common stock in the foreseeable future. Unless we pay dividends, our stockholders will not be able to receive a return on their shares unless they sell them. There is no assurance that stockholders will be able to sell shares when desired.

Downturns in general economic conditions could adversely affect our profitability.

Downturns in general economic conditions can cause fluctuations in demand for our products, product prices, volumes and gross margins. Future economic conditions may not be favorable to our industry. A decline in the demand for our products or a shift to lower-margin products due to deteriorating economic conditions could adversely affect sales of our products and our profitability and could also result in impairments of certain of our assets.

Furthermore, any uncertainty in economic conditions may result in a slowdown to the global economy that could affect our business by reducing the prices that our customers may be able or willing to pay for our products or by reducing the demand for our products.

An increase in the cost of raw materials or electricity might affect our profits.

Any increase in the prices of our raw materials or energy might affect the overall cost of our products. If we are not able to raise our prices to pass on increased costs to our customers, we would be unable to maintain our existing profit margins. Our major cost components include items such as graphite, sulfuric acid, and electricity, which items are normally readily available industrial commodities. During our history as a business, we have not seen any material impact (as defined by GAAP) on our cost structure from fluctuations in raw material or energy costs, but this could change in the future.

Our results of operations could deteriorate if our manufacturing operations were substantially disrupted for an extended period.

Our manufacturing operations are subject to disruption due to extreme weather conditions, floods and similar events, major industrial accidents, strikes and lockouts, adoption of new laws or regulations, changes in interpretations of existing laws or regulations or changes in governmental enforcement policies, civil disruption, riots, terrorist attacks, war, and other events. We cannot assure you that no such events will occur. If such an event occurs, it could have a material adverse effect on us.

Significant risks may be associated with future acquisitions.

We may pursue the acquisition of other companies or product lines in order to add new businesses and/or product lines or simply complement our existing businesses and product lines. Along with such acquisitions come certain risks, including, but not limited to the following:

- the difficulty of identifying appropriate acquisition candidates;
- the difficulty of assimilating the operations and personnel of the acquired entities;
- the potential disruption of our ongoing business;
- the potential incurrence of new debt or the issuance of new equity that could increase our leverage or dilute our stockholders' equity interests;
- our inability to capitalize on the opportunities presented by acquisitions; and
- our failure to implement and maintain uniform standards, controls, procedures and policies at any acquired businesses.

Given our limited resources, we may not effectively manage our growth.

There is no guarantee that we have the resources, financial or operational, required to manage our growth. This is particularly true as we expand facilities and manufacture our products on a greater commercial scale. Furthermore, rapid growth in our operations may place a significant strain on our management, administrative, operational and financial infrastructure. The inability to adequately manage our growth could have a material and adverse effect on our business, financial condition or results of operations, thus resulting in a lower quoted price of our common stock.

Risks Related to our Ongoing Initial Public Offering

Because the offering price for the primary shares has been arbitrarily set by us, you may not realize a return on your investment upon the resale of your shares.

The offering price of the primary offering of each share and other terms and conditions relative to the shares being sold in our ongoing IPO have been arbitrarily determined by us and do not bear any relationship to assets, earnings, book value or any other objective financial criteria. Additionally, as the Company was formed on May 23, 2006, and has only a limited operating history with no earnings, the price of the offered shares in our IPO is not based on its past earnings, and no investment banker, appraiser, or other independent third party, has been consulted concerning the offering price for the shares or the fairness of the offering price used for the shares, as such our stockholders may not be able to receive a return on their investment when they sell shares of common stock purchased in our IPO.

Our officers and directors have limited prior experience offering and selling securities to the public, and our IPO does not require a minimum amount to be raised; as a result, we may not be able to raise sufficient funds to commence and sustain our business and investors may lose all or a significant part of their investment.

If we determine not to engage any sales agents in our ongoing IPO, certain of our officers and directors will conduct the offering on our behalf. We are conducting a best efforts offering for our IPO which does not require a minimum amount to be raised.

Our officers and directors have limited experience conducting a public securities best efforts offering and we may not be able to successfully raise any funds. If we are not able to raise sufficient funds, we may not be able to fund our operations as planned, and we may be forced to curtail or cease operations and investors could lose all or a significant part of their investment. Our inability to successfully conduct a best efforts IPO could be the basis of investors losing all or a significant part of their investment in us.

Due to the lack of trading market for our securities, you may have difficulty selling any shares you purchase in our initial public offering.

We are not registered on any market or public stock exchange. There is presently no demand for our common stock and no public market exists for the shares being offered in our ongoing IPO. Although, after the IPO is completed, we intend to seek a listing or a quotation on a Qualified National Exchange, we cannot make any assurance that our common stock will ever be quoted on Qualified National Exchange or that any market for our stock will develop. In order to achieve a Public Listing, we will have to meet certain initial listing qualifications of the Qualified National Exchange on which we are seeking the Public Listing. In addition, we will need to have market makers agree to make a market in our common stock and file a FINRA Form 15c211 with the SEC on our behalf before we can achieve a Public Listing. As of the date of this Annual Report of Form 10-K, there have been no discussions or understandings between the Company and anyone acting on our behalf, with any market maker regarding participation in a future trading market for our securities. If we are successful in achieving a Public Listing for our common stock, we will also need to remain current in our quarterly and annual filings with the SEC to achieve and maintain such Public Listing. Market makers are not permitted to begin quotation of a security whose issuer does not meet these filing requirements. Furthermore, if we are not able to pay the expenses associated with our ongoing reporting obligations we will not be able to achieve or maintain a Public Listing. If no public market is ever developed for our common stock, it will be difficult for investors to sell any shares they purchase in our IPO. In such a case, investors may find that they are unable to achieve any benefit from their investment or liquidate their shares without considerable delay, if at all. In addition, if we fail to have our common stock quoted on a public trading market, any common stock purchased by investors will not have a quantifiable value and it may be difficult, if not impossible, to ever resell their shares, resulting in an inability to realize any value from their investment.

ITEM 1B. UNRESOLVED STAFF COMMENTS

None.

ITEM 2. PROPERTIES

We lease three separate facilities. Administrative offices and a manufacturing operation are in a 25,000 square foot building with an operating lease that extending to March 2022. Research and Development laboratories are in a 14,300 square foot space with an operating lease that extends to December 2017 and a second manufacturing operation occupies 6,600 square foot on a month-to-month lease. All of the physical assets of the Company are contained within these facilities. XG Sciences has achieved and maintains an ISO9001:2008 quality certification for all of its locations.

ITEM 3. LEGAL PROCEEDINGS

Beginning in 2014, POSCO, one of our licensees and a shareholder, has had a contractual obligation to pay us a minimum fee of \$100,000 per year to license certain technologies. This obligation is due annually on February 28 of the following year. We record this license revenue at a rate of \$25,000 per quarter. POSCO is disputing that they are obligated to pay the royalties. A petition for arbitration has been filed for this matter by the Company on March 9, 2016. On July 7, 2016 we received a letter from the International Court of Arbitration and they have assigned an arbitrator to the case. No assessment or decision has been made by the arbitrator as of the issuance date of this report.

ITEM 4. MINE SAFETY DISCLOSURES

Not applicable.

PART II

ITEM 5. MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Market for Common Equity

We are currently offering up to 2,491,343 shares of our common stock at \$8.00 per share shares of common stock pursuant to our IPO Registration Statement. No public market currently exists for our shares and a public market may never develop, or, if any market does develop, it may not be sustained.

After our IPO is completed, we intend to seek either (i) a listing of our common stock on a securities exchange registered with the SEC under Section 6(a) of the Exchange Act, such as the NASDAQ Capital Market or the NYSE, or (ii) the quotation of our common stock on the OTCQB or OTCQX marketplaces operated by OTC Markets Group, Inc. (each of the foregoing, a "Qualified National Exchange"). In order to achieve such a Public Listing, we will have to meet certain initial listing qualifications of the Qualified National Exchange on which we are seeking the Public Listing. In addition, we will need to have market makers agree to make a market in our common stock and file a FINRA Form 15c211 with the SEC on our behalf before we can achieve a Public Listing, and we will also need to remain current in our quarterly and annual filings with the SEC. As of the date of this report, there have been no discussions or understandings between the Company and anyone acting on our behalf, with any market maker regarding participation in a future trading market for our securities. There can be no assurance that our common stock will ever be quoted or traded on a Qualified National Exchange or that any market for our common stock will develop.

Holders of Equity

As of December 31, 2016, we had 147 record holders of our common stock, and a total of 1,885,175 shares of common stock issued and outstanding. We had 13 record holders of Series A Preferred Stock and a total of 1,829,256 shares of Series A Preferred Stock issued and outstanding. In total, we had 152 shareholders of record of all classes of our capital stock as of December 31, 2016.

Each share of Series A Preferred Stock is voluntarily convertible, at the option of the holder thereof, at any time after the date of issuance and prior to any Public Listing of common stock on a Qualified National Exchange, into that number of fully paid, non-assessable shares of common stock determined by dividing the Original Issue Price by the Conversion Price then in effect, as such terms are defined in the Series A Designations. The current Series A Conversion Rate is 1.875 shares of common stock for each share of Series A Preferred Stock. The Conversion Price of the Series A Preferred Stock is subject to adjustments pursuant to the occurrence of stock splits and certain other specified events, and therefore the respective conversion rates are subject to change.

Furthermore, under the terms of the Series A Designations (as amended), all outstanding shares of Series A Preferred Stock will automatically convert into shares of common stock upon a Public Listing on a Qualified National Exchange at the then-current Series A Conversion Rate. At the current Series A Conversion Rate, if all outstanding shares of Series A Preferred Stock were voluntarily converted or automatically converted, we would issue 3,429,849 shares of common stock to satisfy the conversion.

As of December 31, 2016, the Company had also granted options to purchase up to 369,750 shares of common stock and had issued warrants to purchase up to (i) 318,017 shares of common stock, (including the warrants for 50,000 shares issued under the Dow Facility) and (ii) 1,072,720 shares of Series A Preferred Stock which, if exercised, would be convertible into 2,011,345 shares of common stock at the then-current Series A Conversion Rate (currently of 1.875 shares of common stock for each share of Series A Preferred Stock). Therefore, we have committed to issue up to an additional 6,128,961 shares of common stock, which includes the issuance of (a) 3,429,849 shares upon conversion of all 1,829,256 shares Series A Preferred Stock currently outstanding at the Series A Conversion Rate, (b) 2,011,345 shares upon the conversion of 1,072,720 shares of Series A Preferred Stock (at the current Series A Conversion Rate) which are issuable upon exercise of 1,072,720 Series A warrants, (c) 369,750 shares upon the exercise of options and (d) the issuance of 318,017 shares upon the exercise of warrants. If we issued all 6,128,961 shares, we would have, including the 1,885,175 shares currently outstanding, 8,014,136 shares issued and outstanding, with 16,985,864 authorized shares available for future issuance, and if we assume the sale of all 2,491,343 shares being offered hereunder, we would have 14,494,521 authorized shares available for future issuance. The future issuance of common stock may result in substantial dilution in the percentage of our common stock held by our then existing stockholders. We may value any common stock issued in the future on an arbitrary basis. The issuance of common stock for future services or acquisitions or other corporate actions may have the effect of diluting the value of the shares held by our investors, might have an adverse effect on any trading market for our common stock and could impair our ability to raise capital in the future through the sale of equity securities.

Securities Authorized for Issuance under Equity Compensation Plans

As of December 31, 2016 and December 31, 2015, the Company had outstanding stock options to purchase up to 369,750 and 419,750 shares of common stock, respectively.

In 2007, the Company implemented a Stock Option Plan and initially reserved 75,000 shares of common stock to cover stock options that might be issued under the Stock Option Plan. However, in March 2016, shareholders holding a majority of the outstanding capital stock voted to increase the number shares reserved for issuance under the Stock Option Plan to 1,200,000.

As of December 30, 2016, stock options to purchase a total of 369,750 shares at prices ranging from \$8.00 to \$12.00 per share had been granted to Company employees and Directors, with expiration dates ranging from December 2017 to October 2023, with a weighted average purchase price of \$11.89 per share.

Equity Compensation Plans as of December 31, 2016

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⁾	369,750	\$ 12.00	830,250
Equity compensation plans not approved by security holders	—	—	—
Total	369,750	\$ 12.00	830,250

(1) Reflects our 2007 Stock Option Plan, as amended, for the benefit of our directors, officers, employees and consultants as of December 31, 2016. As of December 31, 2016, we had reserved 1,200,000 shares of common stock for such persons pursuant to that plan and had granted stock options to purchase 369,750 shares at a weighted average price with 830,250 shares remaining available for future issuance.

DIVIDEND POLICY

Since inception, we have not paid any dividends on our common stock. We currently do not anticipate paying any cash dividends in the foreseeable future on our common stock, because we intend to retain our earnings, if any, to finance the growth of our business. Our Board of Directors will have the discretion to declare and pay dividends in the future. Payment of dividends in the future will depend upon our earnings, capital requirements, and other factors, which our Board of Directors may deem relevant.

UNREGISTERED SALES OF EQUITY SECURITIES

On March 9, 2016, we commenced a private placement of promissory notes and warrants to purchase common stock to existing stockholders. The notes are non-convertible and mature on December 31, 2016. The warrants have a five year maturity date with a strike price of \$10.00 per share. During the period from March 9 through April 7, 2016, we issued promissory notes in an aggregate amount of \$574,750 and issued warrants to purchase 11,495 shares of common stock.

On May 17, 2016, we issued 14,280 shares of Series A Preferred Stock to AAOF as payment for lease financing obligations under the terms of a Master Leasing Agreement.

On August 17, 2016, we issued 4,760 shares of Series A Preferred Stock to AAOF as payment for lease financing obligations under the terms of a Master Leasing Agreement.

On September 30, 2016, we issued 2,380 shares of Series A Preferred Stock to AAOF as payment for lease financing obligations under the terms of a Master Leasing Agreement.

On October 1, 2016, we issued 7,140 shares of Series A Preferred Stock to AAOF as payment for lease financing obligations under the terms of a Master Leasing Agreement.

On December 14, 2016, we issued a promissory note in the amount of \$2,000,000 and warrants to purchase 50,000 shares of common stock of the Company to Dow pursuant to the Dow Facility. The notes are non-convertible and mature on December 1, 2021. The warrants have a seven year maturity date with a strike price of \$8.00 per share.

ITEM 6. SELECTED FINANCIAL DATA

Not applicable.

ITEM 7. MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

Business Description

This section includes a number of forward-looking statements that reflect our current views with respect to future events and financial performance. Forward-looking statements are often identified by words like "believe", "expect", "estimate", "anticipate", "intend", "project" and similar expressions, or words which, by their nature, refer to future events. You should not place undue certainty on these forward-looking statements. These forward-looking statements are subject to certain risks and uncertainties that could cause actual results to differ materially from our predictions.

Overview of our Business

XG Sciences was formed in May 2006 for the purpose of commercializing certain technology to produce graphene nanoplatelets. First isolated and characterized in 2004, graphene is a single layer of carbon atoms configured in an atomic-scale honeycomb lattice. Among many noted properties, monolayer graphene is harder than diamonds, lighter than steel but significantly stronger, and conducts electricity better than copper. Graphene nanoplatelets are particles consisting of multiple layers of graphene. Graphene nanoplatelets have unique capabilities for energy storage, thermal conductivity, electrical conductivity, barrier properties, lubricity and the ability to impart strength when incorporated into plastics or other matrices.

We believe the unique properties of graphene and graphene nanoplatelets will enable numerous new product applications and the market for such products will quickly grow to be a significant market opportunity. Our business model is to design, manufacture and sell advanced materials we call xGnP[®] graphene nanoplatelets and value-added products based on these nanoplatelets. We currently have hundreds of customers trialing our products for numerous applications, including, but not limited to lithium ion batteries, supercapacitors, thermal shielding and heat transfer, inks and coatings, printed electronics, construction materials, composites, and military uses. We believe our proprietary processes have enabled us to be a low-cost producer of high quality, graphene nanoplatelets and value-added products containing graphene nanoplatelets and that we are well positioned to address a wide range of end-use applications.

We sell products to customers around the world and have sold materials to over 1,000 customers in 47 countries since 2008. Some of these customers are research organizations and some are commercial organizations. Our customers have included well-known automotive and OEM suppliers around the world (Ford, Johnson Controls, Magna, Honda Engineering) world-scale lithium ion battery manufacturers in the US, South Korea and China (Samsung SDI, LG Chemical, Lishen, A123) and diverse specialty material companies (3M, BASF, Henkel, Dow, DuPont) as well as leading research centers such as Lawrence Livermore National Laboratory and Oakridge National Laboratory. We have also licensed some of our base manufacturing technology to other companies and we consider technology licensing a component of our business model. Our licensees include POSCO, the fourth largest steel manufacturer in the world by volume of output, and Cabot Corporation (“Cabot”), a leading global specialty chemicals and performance materials company. These licensees further extend our technology through their customer networks. Ultimately, we believe we will benefit in terms of royalties on sales of xGnP[®] nanoplatelets produced and sold by our licensees.

We target our xGnP[®] nanoplatelets for use in a range of large and growing end-use markets. Our proprietary manufacturing processes allow us to produce nanoplatelets with varying performance characteristics that can be tuned to specific end-use applications based on customer requirements. We manage our business with four major product lines at this time:

1. **Bulk Materials.** We sell bulk materials under the trademarked brand name of xGnP[®] graphene nanoplatelets. These materials are produced in various grades, which are analogous to average particle thickness, and average particle diameters. There are four commercial grades (Grades C, H, M & R), each of which is offered in three standard particle sizes, which allows for surface areas ranging from 50 to 800 square meters per gram of material depending on the product. These bulk materials, which normally ship in the form of a dry powder, are especially applicable for use as additives in polymeric or metallic composites, or in coatings or other formulations where particular electrical, thermal or barrier applications are desired by our customers. We also offer our material in the form of dispersions of nanoplatelets in liquids such as water, alcohol, or organic solvents, or mixed into resins or polymers such as epoxies or urethanes.
2. **Energy Storage Materials.** These value-added products consist of specialty advanced materials that have been formulated for specific applications in the energy storage segment. Chief among these is our proprietary, specially formulated silicon-graphene composite material (also referred to as “SiG” or “XG SiG[™]”) for use in lithium-ion battery anodes. XG SiG[™] targets the never-ending need for higher battery capacity and longer life. In several customer trials, our SiG material has demonstrated three to five times specific storage capacity improvement compared to what is currently available with conventional lithium ion batteries today. Additionally, we offer various bulk materials for use as conductive additives for cathodes and anodes in li-ion batteries, as an additive to anode slurries for lead-carbon batteries, and we are investigating the use of our materials as part of other battery components.

3. **Thermal Management Materials.** These value-added products consist mainly of two types of products, our XG Leaf[®] sheet products and various custom thermal interface materials (XG TIM[™] or TIM) in the form of greases or pastes. XG Leaf[®] is a family of sheet products ideally suited for use in thermal management in portable electronics, which may include cell phones, tablets and notebook PC's. As these devices continue to adopt faster electronics, higher data management capabilities, brighter displays with ever increasing definition, they generate more and more heat. Managing that heat is a key requirement for the portable electronics market and our XG Leaf[®] product line is well suited to address the need. These sheets are made using special formulations of xGnP[®] graphene nanoplatelets as precursors, along with other materials for specific applications. There are several different types of XG Leaf[®] available in various thicknesses, depending on the end-use requirements for thermal conductivity, electrical conductivity, or resistive heating. Our custom greases and pastes are also designed to be used in various high temperature environments. Additionally, we offer various bulk materials for use as active components in liquids, coatings and plastic composites to impart improved thermal management performance to such matrices.
4. **Inks and Coatings.** These value-added products consist of specially-formulated dispersions of xGnP[®] together with solvents, binders, and other additives to make electrically or thermally conductive products designed for printing or coating and which are showing promise in diverse customer applications such as advanced packaging, electrostatic dissipation and thermal management. We also offer a set of standardized ink formulations suitable for printing. These inks offer the capability to print electrical circuits or antennas, or might be suitable for other electrical or thermal applications. All of these formulations can be customized for specific customer requirements.

Because graphene is a new material, most of our customers are still developing applications that use our products, and thus historically most customers have purchased products in quantities consistent with development purposes. The process of "designing-in" new materials is a relatively complex and involves the use of relatively small amounts of the new material in laboratory and engineering development for an extended period of time. Following successful development, we believe customers that incorporate our materials into their products will then order much larger quantities of material to support commercial production. Thus, while many of our customers are currently purchasing our materials in kilogram (one or two pound) quantities, we believe many will require tons or even hundreds of tons of material when they commercialize products that incorporate our materials. Although, our customers are under no obligation to report to us on the usage of our materials, some have indicated that they have introduced or will soon introduce commercial products that use our materials.

We are tracking the commercial and development status of more than 100 customer/product engagements. As of December 31, 2016, we have eight customers who are using our materials in their products and actively selling them to their customers or actively promoting them for future sales. In addition, we have another eight customers who have indicated that they expect to begin shipping product incorporating our materials in the next 3 – 6 months, and have another fourteen customers who have indicated an intent to commercialize in the next 6 – 9 months. We also have tens of customers with whom we are working that have not yet indicated an exact date for commercialization, but we believe have the potential to contribute to revenue in 2017. We anticipate that the average order size for these customers will increase in 2017 as their demand grows. As a result, we believe we will begin shipping significantly greater quantities of our products, and thus begin rapidly scaling revenue in 2017 and 2018. Based on the status of current discussions with customers and their feedback on the performance of our materials in their products, we believe we will be able to recognize approximately \$8 – 10 million of revenue in 2017 and approximately \$20 – \$30 million of revenue in 2018.

Operating Segment

We have one reportable operating segment that manufactures xGnP[®] graphene nanoplatelets and value-added products produced therefrom, we conduct research on graphene nanoplatelets and related products, and licenses our technology as appropriate. As of December 31, 2016 we shipped products on a worldwide basis, but all of our assets were located within the United States.

Our Critical Accounting Policies

US generally accepted accounting principles (“GAAP”) requires management to make estimates, judgments and assumptions that affect the reported amounts of assets, liabilities, revenues and expenses, together with amounts disclosed in the related notes to the consolidated financial statements. Actual results and outcomes may differ from management’s estimates, judgments and assumptions. Significant estimates, judgments and assumptions used in our consolidated financial statements include, but are not limited to, those related to revenues, accounts receivable and related allowances, contingencies, useful lives and recovery of long-term assets, income taxes, and the fair values of stock-based compensation and derivative financial instrument liabilities. These estimates, judgments, and assumptions are reviewed periodically and the effects of material revisions in estimates are reflected in the consolidated financial statements prospectively from the date of the change in estimate.

Revenue Recognition

We recognize revenues when (a) the price is fixed or determinable, (b) persuasive evidence of a sales arrangement exists, (c) the service is performed or delivery has occurred and (d) collectability of the resulting receivable is reasonably assured.

We recognize product revenues when products are shipped to customers. At that time, product ownership and risk have transferred to the customer and we have no further obligations. We record product sales at net selling prices that are reflective of discounts and allowances. Shipping and handling costs are recorded as a component of direct costs, as are shipping and handling costs billed to customers.

Revenue related to licensing agreements is recorded upon substantial performance of the terms of the licensing contract. In the case of licensing arrangements that involve up-front payments, revenue is recorded when management determines that the appropriate terms of the contract have been fulfilled. For example, this may occur when technology has been transferred via written documents or, if training is involved, whenever all contracted training has occurred. In the case of licenses where product delivery is also embedded in the deliverable, a portion of revenue would be recognized when products are delivered.

In the case of licensing arrangements that involve ongoing royalties based on sales of products produced with our technology, royalty income is recorded when received or, in the case of minimum royalties due, in the period when due.

Grant contract revenue is recognized over the life of the contracts as the services are performed.

Amounts received in excess of revenues earned are recorded as deferred revenue.

Stock-Based Compensation

We recognize compensation expense in our statement of operations for all share-based option and stock awards, based on estimated grant-date fair values.

We estimate the grant-date fair value of stock-based compensation awards using the Black-Scholes option valuation model. This model is affected by the estimated value of our common stock on the date of the grant as well as assumptions regarding a number of highly complex and subjective variables. These variables include the expected term of the option, the exercise price, expected risk-free rates of return, the expected volatility of our common stock, and expected dividend yield, each of which is more fully described below. The assumptions for the estimated value of our common stock, expected term and expected volatility are the assumptions that most significantly affect the grant date fair value.

Estimated Value of our common stock: The estimated fair value of the Company’s common stock was based on a number of objective and subjective factors, including external market conditions affecting the Company’s industry sector, the prices at which the Company sold shares of convertible preferred stock, and the superior rights and preferences of securities senior to the Company’s common stock at the time. The Company used the option pricing method, utilizing the back-solve method, which is a form of the market approach defined in the American Institute of Certified Public Accountants, or AICPA, *Audit and Accounting Practice Aid Series: Valuation of Privately Held Company Equity Securities Issued as Compensation*, used to estimate the fair value of common stock. The valuation methodology included estimates and assumptions that require the Company’s judgment.

Expected Term: Because we have limited experience related to the exercise of employee stock options, we use the simplified method permitted by SEC Staff Accounting Bulletin Topic 14 to estimate the expected term of the options. The expected term of an option is estimated to be equal to the mid-point between the vesting and expiration dates of the option

Risk-free Interest Rate: We base the risk-free interest rate used on the implied yield at the grant date of U.S. Treasury zero-coupon issues with a term approximately equal to the expected term of the stock-based award being valued.

Expected Stock Price Volatility: Because we were a private company with very limited stock sales history, we use a blended average weekly volatility of certain publicly traded peer companies. We believe that the use of this blended average peer volatility is reflective of market conditions and a reasonable indicator of our expected future volatility.

Dividend Yield: Because we have never paid a dividend and do not expect to begin doing so in the foreseeable future, we have assumed a 0% dividend yield in valuing our stock-based awards.

The grant-date fair value of the award is recognized as expense over the requisite service period using the straight-line method.

Fair Value Measurements

FASB ASC 820: "Fair Value Measurements and Disclosures" defines fair value as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. ASC 820 also establishes a fair value hierarchy which requires an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value. The standard describes three levels of inputs that may be used to measure fair value:

Level 1: Quoted prices in active markets for identical assets or liabilities.

Level 2: Inputs other than quoted prices included within Level 1 which are either directly or indirectly observable.

Level 3: Inputs to the valuation methodology are unobservable and significant to the fair value measurement.

A financial instrument's level within the fair value hierarchy is based on the lowest level of any input that is significant to the fair value measurement. Our derivative liabilities are classified as Level 3 within the fair value hierarchy because they were valued using other unobservable inputs. The valuation technique used to measure fair value of the derivative liabilities is based on a lattice model with significant assumptions and inputs determined by the Company. A lattice model was used to estimate the fair value of the derivative liabilities because management believes it reflects all the assumptions that market participants would likely consider including early exercise of the warrants. The fair value of the derivative liabilities will be significantly influenced by the fair value of our common stock, stock price volatility and the risk-free interest components of the lattice technique.

Derivative Financial Instruments

We do not use derivative instruments to hedge exposures to cash flow, market or foreign currency risk. The terms of convertible preferred stock and convertible notes that we have issued in the past were reviewed to determine whether or not they contain embedded derivative instruments that are required by ASC 815: "Derivatives and Hedging" to be accounted for separately from the host contract, and recorded at fair value. In addition, freestanding warrants are also reviewed to determine if they achieve equity classification. Certain warrants that we have issued did not meet the conditions for equity classification and are classified as derivative instrument liabilities measured at fair value. The fair values of these derivative liabilities are revalued at each reporting date, with the change in fair value recognized in earnings. See Note 9 of the consolidated financial statements for additional information.

Liquidity

We have historically incurred recurring losses from operations and we may continue to generate negative cash flows as we implement our business plan. Our consolidated financial statements are prepared using GAAP as applicable to a going concern, which contemplates the realization of assets and liquidation of liabilities in the normal course of business.

As of December 31, 2016, we had cash on hand of \$1,785,343 and at March 28, 2017 cash on hand of \$1,138,157 and currently available funds of \$3,000,000 under the Dow Facility, which we believe is sufficient to fund our operations through October 2017. We believe that we will need an additional approximately \$1 million to sustain us for the next 12 months for which we have a commitment from a shareholder. Our financial projections show that we may need to raise an additional \$15 million or more before we are capable of achieving sustainable cash flow from operations. We intend that the primary means for raising such funds will be through our IPO, the additional \$3 million of currently available funds under the Dow Facility (see note 7), and up to an additional \$5 million of proceeds from the Dow Facility after we have raised \$10 million of additional equity capital in the period beginning on November 1, 2016. There can be no assurance that we will be able to raise additional equity capital in the IPO or in subsequent equity offerings or that the terms and conditions of any future financings will be workable or acceptable to us and our stockholders.

There has been no public market for our securities and a public market may never develop, or, if any market does develop, it may not be sustained. Our common stock is not currently quoted on or traded on any exchange or on any over-the-counter market. In the event we are unable to fund our operations from existing cash on hand, operating cash flows, additional borrowings or raising equity capital, we may be forced to reduce our expenses, slow down our growth rate, or discontinue operations. Our condensed consolidated financial statements do not include any adjustments relating to the recoverability and classification of recorded asset amounts or the amounts and classification of liabilities that might be necessary should we be unable to continue as a going concern.

Recent Accounting Pronouncements

In May 2014, the Financial Accounting Standards Board, or FASB, issued Accounting Standards Update No. 2014-09, *Revenue From Contracts With Customers*, or ASU 2014-09. Pursuant to this update, an entity should recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. The amendments in this update are currently effective for annual reporting periods beginning after December 15, 2016, including interim periods within that reporting period, and are to be applied retrospectively, or on a modified retrospective basis. Early application is not permitted. In July 2015, the FASB approved a one year deferral of the effective date for annual reporting periods beginning after December 15, 2017 with early adoption permitted for annual periods beginning after December 15, 2016. We are currently evaluating the impact of adopting ASU 2014-09 on our consolidated financial statements.

In August 2014, FASB issued ASU 2014-15, *Disclosure of Uncertainties about an Entity's Ability to Continue as a Going Concern*, or ASU 2014-15. ASU 2014-15 explicitly requires a company's management to assess an entity's ability to continue as a going concern, and to provide related footnote disclosures in certain circumstances. The new standard will be effective in the first annual period ending after December 15, 2016, although early application is permitted. We believe the adoption of this standard will have no material impact on our consolidated statements of financial position, results of operations or cash flows.

In April 2015, the FASB issued ASU No. 2015-03, *Simplifying the Presentation of Debt Issuance Costs*, or ASU 2015-03. ASU 2015-03 requires debt issuance costs to be presented in the balance sheet as a direct deduction from the carrying value of the associated debt liability, consistent with the presentation of a debt discount. The standard also aligns the GAAP presentation with International Financial Reporting Standards and will remedy the long-standing conflict with the guidance in FASB Concepts Statement No. 6, *Elements of Financial Statements*, which indicates that debt issuance costs do not meet the definition of an asset, because they provide no future economic benefit. ASU No. 2015-03 is effective for financial statements issued for fiscal years beginning after December 15, 2015, and interim periods within those fiscal years. Early adoption is permitted for financial statements that have not been previously issued. The new guidance will be applied on a retrospective basis. The adoption of this guidance during the year ended December 31, 2016 did not have a material impact on our consolidated balance sheets.

On February 24, 2016, the FASB issued ASU No. 2016-02, Leases, requiring lessees to recognize a right-of-use asset and a lease liability on the balance sheet for all leases with the exception of short-term leases. For lessees, leases will continue to be classified as either operating or finance leases in the income statement. Lessor accounting is similar to the current model but updated to align with certain changes to the lessee model. Lessors will continue to classify leases as operating, direct financing or sales-type leases. The effective date of the new standard for public companies is for fiscal years beginning after December 15, 2018 and interim periods within those fiscal years. Early adoption is permitted. The new standard must be adopted using a modified retrospective transition and requires application of the new guidance at the beginning of the earliest comparative period presented. We are currently evaluating the effect that the updated standard will have on our consolidated financial statements and related disclosures.

On March 30, 2016, the FASB issued ASU No. 2016-09, Improvements to Employee Share-Based Payment Accounting, which simplifies various aspects related to the accounting and presentation of share-based payments. The amendments require entities to record all tax effects related to share-based payments at settlement or expiration through the income statement and the windfall tax benefit to be recorded when it arises, subject to normal valuation allowance considerations. All tax-related cash flows resulting from share-based payments are required to be reported as operating activities in the statement of cash flows. The updates relating to the income tax effects of the share-based payments including the cash flow presentation must be adopted either prospectively or retrospectively. Further, the amendments allow the entities to make an accounting policy election to either estimate forfeitures or recognize forfeitures as they occur. If an election is made, the change to recognize forfeitures as they occur must be adopted using a modified retrospective approach with a cumulative effect adjustment recorded to opening retained earnings. The effective date of the new standard for public companies is for fiscal years beginning after December 15, 2016 and interim periods within those fiscal years. Early adoption is permitted. We believe the adoption of this standard will have no material impact on our consolidated statements of financial position, results of operations or cash flows.

In July 2015, the FASB issued ASU No. 2015-11, (“ASU 2015-11”), Inventory (Topic 330): Simplifying the Measurement of Inventory. ASU 2015-11 requires an entity to measure in scope inventory at the lower of cost and net realizable value. The amendment does not apply to inventory that is measured using last-in, first-out or the retail inventory method. For public entities, ASU 2015-11 is effective for fiscal years beginning after December 15, 2016, and interim periods within those fiscal years, and is to be applied prospectively. We do not expect the adoption of this standard will have a material effect on our consolidated statements of financial position, results of operations, or cash flows.

With the exception of the standards discussed above, we believe there have been no new accounting pronouncements effective or not yet effective that have significance, or potential significance, to our consolidated financial statements.

JOBS Act

In April 2012, the Jumpstart Our Business Startups Act of 2012, or the JOBS Act, was enacted. Section 107 of the JOBS Act provides that an “emerging growth company,” or EGC, can take advantage of the extended transition period for complying with new or revised accounting standards. Thus, an EGC can delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. We have irrevocably elected not to avail ourselves of this extended transition period and, as a result, we will adopt new or revised accounting standards on the relevant dates on which adoption of such standards is required for other public companies.

We are in the process of evaluating the benefits of relying on other exemptions and reduced reporting requirements under the JOBS Act. Subject to certain conditions, as an EGC, we intend to rely on certain of these exemptions, including exemptions from the requirement to provide an auditor’s attestation report on our system of internal controls over financial reporting pursuant to Section 404(b) of the Sarbanes-Oxley Act and from any requirement that may be adopted by the Public Company Accounting Oversight Board regarding mandatory audit firm rotation or a supplement to the auditor’s report providing additional information about the audit and the financial statements, known as the auditor discussion and analysis. We will remain an EGC until the earlier of: the last day of the fiscal year in which we have total annual gross revenues of \$1.0 billion or more; the last day of the fiscal year following the fifth anniversary of the date of the completion of our IPO; the date on which we have issued more than \$1.0 billion in nonconvertible debt during the previous three years; or the date on which we are deemed to be a large accelerated filer under the rules of the SEC.

Results of Operations for the Year Ended December 31, 2016 Compared with the Year Ended December 31, 2015

The following table summarizes the results of our operations for the years ended December 31, 2016 and 2015.

	Year Ended December 31		Change 2015 – 2016	
	2016	2015	\$	%
Total Revenues	\$ 736,490	\$ 642,592	93,898	14.6
Cost of Goods Sold	1,586,662	1,847,714	(261,052)	(14.1)
Gross Loss	(850,172)	(1,205,122)	354,950	(29.5)
Research & Development Expense	1,124,165	1,485,283	(361,118)	(24.3)
Sales, General & Administrative Expense	3,548,605	4,119,329	(570,724)	(13.9)
Total Operating Expense	4,672,770	5,604,612	(931,842)	(16.6)
Operating Loss	(5,522,942)	(6,809,734)	1,286,792	(18.9)
Other Expense	(5,220)	(9,872,911)	9,867,691	(99.9)
Net Loss	(5,528,162)	(16,682,645)	11,154,483	(66.9)
Deemed dividend on Series A Convertible preferred stock	—	(2,214,856)	2,214,856	(100.0)
Net loss attributable to common stockholders	\$ (5,528,162)	\$ (18,897,501)	13,369,339	(70.7)

Revenues

Revenues for the years ended December 31, 2016 and 2015, by category, are shown below.

	Year Ended December 31		Change 2015 – 2016	
	2016	2015	\$	%
Product Sales	\$ 356,730	\$ 164,153	192,577	117.3
Grants	279,760	378,439	(98,679)	(26.1)
Licensing Revenues	100,000	100,000	—	—
Total	\$ 736,490	\$ 642,592	93,898	14.6

Product sales consist of two broad categories: (1) material sold to customers for research or development purposes; and (2) production orders for customers. Typically, the order sizes for the first category are relatively small, however we expect orders in the second category to be much larger in the future. In 2016, product sales were up \$192,577, or 117.3%. The main reason for the increase was customers moving through development programs towards commercialization, requiring larger quantities of our materials for advanced testing and pilot production activities. The table below shows a comparison of product sales by product line.

Product Sales Summary

Product	Year Ended December 31		Change 2015 – 2016	
	2016	2015	\$	%
xGnP [®] Bulk Material	\$ 271,448	\$ 104,797	166,651	159.0
Battery Anode Materials (XG SiG [™])	41,150	29,215	11,935	40.9
XG Leaf [®]	16,235	15,281	954	6.2
Inks and Coatings	27,897	14,860	13,037	87.7
Total	\$ 356,730	\$ 164,153	192,577	117.3

We ship our products from our Lansing manufacturing facilities to customers around the world. During 2016, we shipped materials to customers in 27 different countries, versus 26 countries in 2015. Shipments to only one country other than the United States accounted for more than 10% of product revenues during the years ended December 31, 2016 and 2015. That country (South Korea) accounted for approximately 14% and 12% of total product revenues during each of the respective periods.

Order Summary

The table below shows a comparison of domestic and international orders fulfilled, excluding no charge orders. The table also includes the average order size for product sales reflected in our Statement of Operations. These numbers indicate that our customer base remains active with development or research projects that use our materials and the breadth of our geographic coverage. The average order size for the product revenue reflected in our statement of operations for 2016 increased by 136% as compared to 2015. Although the average size of these orders is still relatively small, we are encouraged that the trend is increasing. The current average order size indicated that most of our orders are for R&D and development activity. We expect that our average order size will begin to increase significantly once our customers begin to commercialize products that incorporate our materials within them and existing customers ramp up production volume.

	Year Ended December 31		Change 2015 – 2016	
	2016	2015	\$	%
Number of orders – domestic	109	139	(30)	(21.6)
Number of orders – international	137	128	9	7
Number of orders – total	246	267	(21)	(7.9)
Average order size – \$	\$ 1,453	\$ 615	\$ 838	136.3

Grant Revenue

Grant revenues of \$279,760 in 2016 consisted of proceeds from sources as shown in the table below. The largest of these sources in both 2016 and 2015 came from DOE. In 2016 the DOE award was a Phase II SBIR and it was a follow-on for continued development of the materials investigated under the Phase I program entitled “Low-cost, High-Energy Si/Graphene Anodes for Li-Ion Batteries.” The DOE award proceeds in 2015 were for a total of \$999,899 to fund a research project over a planned two-year period which began in January 2014 through June 2016. The grant has been billed in full and is now considered completed. In June 2016, a new \$150,000, nine month, DOE Phase I SBIR grant was awarded to develop and demonstrate a composite anode material that delivers improved capacity retention during full Lithium-ion battery charge to further the nation’s energy strategy to reduce reliance on fossil fuels and improve the environment. The table below shows the components of grant revenue.

	Year Ended December 31	
	2016	2015
US Department of Energy grant	\$ 214,597	\$ 378,439
Michigan Emerging Technologies Fund	25,000	—
Daimler / University of Michigan	40,163	—
Total	<u>\$ 279,760</u>	<u>\$ 378,439</u>

Licensing Revenue

Licensing revenues during the years ended December 31, 2016 and 2015 were accrued based on minimum royalty payments from a production license granted in 2011, which stipulates a minimum of \$100,000 in royalties are due to XGS starting in 2014 and annually thereafter. These revenues are being accrued at the rate of \$25,000 per quarter. However, a dispute has arisen regarding interpretation of the licensing agreement, so we reserved half of these revenues as a potential bad debt. Please see the discussion of bad debt expense in the subsection entitled “Sales, General and Administrative Expenses” herein below.

Cost of Goods Sold

We use a standard cost system to estimate the direct costs of products sold. Direct costs include estimates of raw material costs, packaging, freight charges net of those billed to customers, and an allocation for direct labor and manufacturing overhead. Because of the nature of our production processes, there is a substantial fixed manufacturing expense requirement that represents the ongoing cost of maintaining production facilities that are not directly related to products sold, so we use a “full capacity” allocation of overhead based on an estimate of what product costs would be if the manufacturing facilities were operating on a full-time basis and producing products at the designed capacity. This estimate involves estimating both the level of expenses as well as production amounts as if the manufacturing facility were operating on a continuous, three-shift, production basis.

The following table shows the relationship of direct costs to product sales for the years ended December 31, 2016 and 2015:

Gross Profit Summary

	Year Ended December 31		Change 2015 – 2016	
	2016	2015	\$	%
Product Sales	\$ 356,730	\$ 164,153	192,577	117.3
Direct Costs	172,394	97,590	74,804	76.7
Direct Cost Margin	<u>184,336</u>	<u>66,563</u>	<u>117,773</u>	<u>176.9</u>
% of Sales	51.7%	40.5%		
Unallocated Manufacturing Expense	1,414,268	1,750,124	(335,856)	(19.2)
Gross Loss on Product Sales	<u>\$ (1,229,932)</u>	<u>\$ (1,683,561)</u>	<u>453,629</u>	<u>(26.9)</u>

We believe that the fluctuations in direct cost from period to period are not indicative of overall performance or of future margins because of the relatively small size of our sales in comparison to our future expectations. Direct costs vary depending on the size of an order, the specific products being ordered, and other factors like shipping destination.

Costs associated with grant revenues tend to be a mixture of facilities use, management time, labor from scientists, technicians and manufacturing personnel, and some supplies. Because of the difficulty of developing and maintaining an administrative system to gather direct costs for grants, together with the relatively small size of grant revenues, we do not track direct costs for grant revenues as a separate cost category. Therefore, we do not calculate direct cost margins associated with grant revenues but, rather, we view these revenues as being supported by indirect corporate expenses.

Costs associated with licensing revenue tend to be a mixture of IP costs as well as management and administrative expenses that are indirect in nature. As such, we do not assign direct costs to licensing revenues. Where revenues from a license agreement can be assigned to specific product revenues, we classify these revenues as product sales and, using our standard cost system, assign direct costs to those sales.

The remaining “non-direct” costs of operating our manufacturing facilities are recorded as unallocated manufacturing expenses. These expenses include personnel costs, rent, utilities, indirect supplies, depreciation, and related indirect expenses. Unallocated manufacturing expenses are expensed as incurred. We allocate these costs as direct product costs on the basis of the proportion of these expenses that would be representative product costs if we were operating our factory at full capacity.

For the year ended December 31, 2016, unallocated manufacturing expenses decreased by 19% to \$1,414,268 as compared to \$1,750,124 in 2015. The decrease of \$335,856 is largely due to cost containment measures implemented in prior years and maintained in 2016.

Research and Development Expenses

Research and Development expenses for the year ended December 31, 2016 decreased by 24% to \$1,124,165 as compared to \$1,485,283 for the year ended December 31, 2015. The decrease of \$361,118 is largely due to cost containment measures implemented in prior years and maintained in 2016.

Sales, General and Administrative Expenses

During 2016 we incurred selling, general and administrative expenses (SGA) of \$3,500,000. This is a decrease of approximately \$571,000 or 14% from 2015. For both years compensation and related expenses accounted for approximately 71% of the total SGA expenses; approximately \$2,500,000 in 2016 and approximately \$2,900,000 in 2015, respectively. In 2016 there was a decrease in compensation related expenses of \$404,000 or 14% from 2015. Overall SGA decreases in the current year were largely driven by cost containment measures adopted in prior years and maintained in 2016. As we continue to grow and gain traction in the marketplace our SGA expenses will fluctuate but should stabilize and become more fixed in nature as we achieve economies of scale.

Other Income (Expense)

The following table shows a comparison of other income and expense by major expense component for the years ended December 31, 2016 and 2015:

	Year Ended December 31		Change 2015 – 2016	
	2016	2015	\$	%
Incentive Refund & Interest Income	\$ 80,259	\$ 94,507	(14,248)	(15.1)
Interest Expense	(298,832)	(7,387,256)	7,088,424	(96)
Gain (loss) from change in fair value of derivative liability – warrants	283,496	(2,513,476)	2,796,972	(111.3)
Loss on disposal of equipment and intangible assets	(70,143)	(66,686)	(3,457)	5.2
Total	\$ (5,220)	\$ (9,872,911)	9,867,691	(99.9)

Interest expense for the year ended December 31, 2016 was substantially lower than the prior year because the convertible notes outstanding in 2015 were converted to common stock on December 31, 2015.

Cash Flow Summary

The following condensed cash flow statement compares cash flow from operating, investing, and financing activities for the year ended 2016 and 2015. Net cash used by operating activities decreased 30% during 2016 as compared to 2015 because of reduced operating expenses, as discussed above.

	Year Ended December 31		Change 2015 – 2016	
	2016	2015	\$	%
Cash, beginning of period	\$ 1,060,224	\$ 2,088,866	(1,028,642)	(49.2)
Net Cash provided (used) by:				
Operating activities	(3,964,206)	(5,635,517)	1,671,311	(29.7)
Investing Activities	(216,777)	(246,759)	29,982	(12.2)
Financing Activities	4,906,102	4,853,634	52,468	1.1
Net increase (decrease) in cash	725,119	(1,028,642)	1,753,761	(170.5)
Cash, end of period	\$ 1,785,343	\$ 1,060,224	725,119	68.4

Investing activities for the year ended December 31, 2016 included net capital expenditures for the purchase of property and equipment of \$93,002 and \$123,775 for intellectual property as compared with \$131,842 for property and equipment and \$114,917 for intellectual property during 2015. These levels of capital expenditures are significantly lower than expected in the future as we begin to ramp up production capacity to meet customer orders. Therefore, these expenditures should not be interpreted as indicative of future expenditures in this area.

Financing activities provided a net increase in cash of approximately \$5,000,000 in both 2016 and 2015. 2016 included net proceeds from the issuance of common stock of approximately \$3,400,000, proceeds from the loan from Dow of \$2,000,000 and net repayments on short-term promissory notes of \$550,000. 2015 included proceeds of approximately \$4,300,000 from the issuance of preferred stock and \$550,000 from the proceeds of short-term promissory notes.

Liquidity and Capital Expenditures

As of December 31, 2016, we had cash on hand of \$1,785,343 and at March 28, 2017 cash on hand of \$1,138,157 and currently available funds of \$3,000,000 under the Dow Facility, which we believe is sufficient to fund our operations through October 2017. We believe that we will need an additional approximately \$1 million to sustain us for the next 12 months for which we have a commitment from a shareholder. Our financial projections show that we may need to raise an additional \$15 million or more before we are capable of achieving sustainable cash flow from operations. We intend that the primary means for raising such funds will be through our IPO, the additional \$3 million of currently available funds under the Dow Facility, and up to an additional \$5 million of proceeds from the Dow Facility after we have raised \$10 million of additional equity capital in the period beginning on November 1, 2016. There can be no assurance that we will be able to raise additional equity capital in the IPO or in subsequent equity offerings or that the terms and conditions of any future financings will be workable or acceptable to us and our stockholders.

Off-Balance Sheet Arrangements

We do not have any off-balance sheet arrangements that have or are reasonably likely to have a current or future effect on our financial condition or results of operations.

ITEM 7A. QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISKS

Not applicable.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

**XG SCIENCES, INC.
CONSOLIDATED FINANCIAL STATEMENTS
INDEX TO FINANCIAL STATEMENTS**

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Board of Directors
XG Sciences, Inc.

We have audited the accompanying consolidated balance sheets of XG Sciences, Inc. (the "Company") as of December 31, 2016 and 2015, and the related consolidated statements of operations, changes in stockholders' deficit, and cash flows for the years then ended. These consolidated financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. Our audits included consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion. An audit also includes examining, on a test basis, evidence supporting the amounts and disclosures in the consolidated financial statements, assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the consolidated financial position of the Company as of December 31, 2016 and 2015, and the consolidated results of its operations and its consolidated cash flows for the years then ended in conformity with accounting principles generally accepted in the United States of America.

/s/ Frazier & Deeter, LLC

Frazier & Deeter, LLC
Tampa, FL
March 31, 2017

XG SCIENCES, INC.
CONSOLIDATED BALANCE SHEETS AS OF DECEMBER 31, 2016 AND 2015

	2016	2015
ASSETS		
CURRENT ASSETS		
Cash	\$ 1,785,343	\$ 1,060,224
Accounts receivable, less allowance for doubtful accounts of \$10,000 in 2016 and 2015, respectively	99,078	54,413
Inventories	205,973	229,034
Incentive refunds receivable	165,635	86,000
Other current assets	174,495	108,096
Total current assets	<u>2,430,524</u>	<u>1,537,767</u>
PROPERTY, PLANT AND EQUIPMENT, NET	2,886,421	3,753,248
RESTRICTED CASH FOR LETTER OF CREDIT	195,499	195,206
INTANGIBLE ASSETS, NET	478,019	411,789
TOTAL ASSETS	\$ 5,990,463	\$ 5,898,010
LIABILITIES AND STOCKHOLDERS' DEFICIT		
CURRENT LIABILITIES		
Accounts payable and other current liabilities	\$ 964,757	\$ 704,177
Short-term promissory notes	—	497,324
Deferred revenue	6,428	—
Current portion of capital lease obligations	268,667	178,487
Total current liabilities	<u>1,239,852</u>	<u>1,379,988</u>
LONG-TERM LIABILITIES		
Long-term portion of capital lease obligations	115,106	354,483
Long term debt	1,862,120	—
Derivative liability – warrants	7,900,249	8,235,163
Total long-term liabilities	<u>9,877,475</u>	<u>8,589,646</u>
TOTAL LIABILITIES	11,117,327	9,969,634
STOCKHOLDERS' DEFICIT		
Series A convertible preferred stock, 3,000,000 shares authorized, 1,829,256 and 1,800,696 shares issued and outstanding, liquidation value of \$21,951,072 and \$21,608,352 at December 31, 2016 and December 31, 2015, respectively	21,634,597	21,291,912
Series B Preferred Stock, 1,500,000 shares authorized, 0 and 269,987 shares issued and outstanding, liquidation value of \$0 and \$4,319,792 at December 31, 2016 and December 31, 2015, respectively	—	3,651,533
Common stock, no par value, 25,000,000 shares authorized, 1,885,175 and 836,544 shares issued and outstanding at December 31, 2016 and December 31, 2015, respectively	15,647,839	8,565,225
Additional paid-in capital	6,490,230	5,791,074
Accumulated deficit	(48,899,530)	(43,371,368)
Total stockholders' deficit	<u>(5,126,864)</u>	<u>(4,071,624)</u>
TOTAL LIABILITIES AND STOCKHOLDERS' DEFICIT	\$ 5,990,463	\$ 5,898,010

See notes to consolidated financial statements

XG SCIENCES, INC.
CONSOLIDATED STATEMENTS OF OPERATIONS
FOR THE YEARS ENDED DECEMBER 31, 2016 AND 2015

	2016	2015
REVENUES		
Product sales	\$ 356,730	\$ 164,153
Grants	279,760	378,439
Licensing revenue	100,000	100,000
Total revenues	<u>736,490</u>	<u>642,592</u>
COST OF GOODS SOLD		
Direct costs	172,394	97,590
Unallocated manufacturing expenses	1,414,268	1,750,124
Total cost of goods sold	<u>1,586,662</u>	<u>1,847,714</u>
GROSS LOSS	<u>(850,172)</u>	<u>(1,205,122)</u>
OPERATING EXPENSES		
Research and development	1,124,165	1,485,283
Sales, general and administrative	3,548,605	4,119,329
Total operating expenses	<u>4,672,770</u>	<u>5,604,612</u>
OPERATING LOSS	<u>(5,522,942)</u>	<u>(6,809,734)</u>
OTHER INCOME (EXPENSE)		
Incentive refund and interest income	80,259	94,507
Interest expense	(298,832)	(7,387,256)
Gain (loss) from change in fair value of derivative liability – warrants	283,496	(2,513,476)
Loss on disposal of equipment and intangible assets	(70,143)	(66,686)
Total other expense	<u>(5,220)</u>	<u>(9,872,911)</u>
NET LOSS	<u>(5,528,162)</u>	<u>(16,682,645)</u>
Deemed dividend on Series A convertible preferred stock	—	(2,214,856)
NET LOSS ATTRIBUTABLE TO COMMON STOCKHOLDERS	<u>\$ (5,528,162)</u>	<u>\$ (18,897,501)</u>
WEIGHTED AVERAGE NUMBER OF SHARES OUTSTANDING – Basic and diluted	<u>1,112,647</u>	<u>836,225</u>
NET LOSS PER SHARE – Basic and diluted	<u>\$ (4.97)</u>	<u>\$ (22.60)</u>

See notes to consolidated financial statements

XG SCIENCES, INC.
CONSOLIDATED STATEMENT OF CHANGES IN STOCKHOLDERS' DEFICIT
FOR THE YEARS ENDED DECEMBER 31, 2016 AND 2015

	Preferred stock (A)		Preferred stock (B)		Common stock		Additional paid-in capital	Accumulated deficit	Total
	Shares	Amount	Shares	Amount	Shares	Amount			
Balances, December 31, 2014	316,010	\$ 3,475,686	—	\$ —	835,144	\$ 8,551,225	\$ 5,192,295	\$ (26,688,723)	\$ (9,469,517)
Stock issued for cash	—	—	269,987	4,319,792	1,400	14,000	—	—	4,333,792
Proceeds allocated to warrants	—	—	—	(668,259)	—	—	—	—	(668,259)
Convertible notes converted to preferred stock – Series A	1,456,126	17,473,540	—	—	—	—	—	—	17,473,540
Preferred stock issued – beneficial conversion feature	—	(2,214,856)	—	—	—	—	2,214,856	—	—
Preferred stock issued – deemed dividend from beneficial conversion feature	—	2,214,856	—	—	—	—	(2,214,856)	—	—
Preferred stock issued to pay capital lease obligations	28,560	342,686	—	—	—	—	—	—	342,686
Employee stock option expense	—	—	—	—	—	—	598,779	—	598,779
Net loss	—	—	—	—	—	—	—	(16,682,645)	(16,682,645)
Balances, December 31, 2015	1,800,696	21,291,912	269,987	3,651,533	836,544	8,565,225	5,791,074	(43,371,368)	(4,071,624)
Stock issued for cash	—	—	—	—	508,657	4,069,255	—	—	4,069,255
Stock issuance fees and expenses	—	—	—	—	—	(638,174)	—	—	(638,174)
Series B stock exchanged for common stock	—	—	(269,987)	(3,651,533)	539,974	3,651,533	—	—	—
Reclassification of Derivative Liability to Equity	—	—	—	—	—	—	51,418	—	51,418
Warrants issued with Bridge Financings	—	—	—	—	—	—	24,060	—	24,060
Warrants issued with Dow Financing	—	—	—	—	—	—	143,146	—	143,146
Preferred stock issued to pay capital lease obligations	28,560	342,685	—	—	—	—	—	—	342,685
Employee stock option expense	—	—	—	—	—	—	480,532	—	480,532
Net loss	—	—	—	—	—	—	—	(5,528,162)	(5,528,162)
Balances, December 31, 2016	1,829,256	\$21,634,597	—	\$ —	1,885,175	\$15,647,839	\$ 6,490,230	\$ (48,899,530)	\$ (5,126,864)

See notes to consolidated financial statements

XG SCIENCES, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS
DECEMBER 31, 2016 AND 2015

	2016	2015
CASH FLOWS FROM OPERATING ACTIVITIES		
Net loss	\$ (5,528,162)	\$ (16,682,645)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation and amortization	908,896	964,382
Amortization of intangible assets	38,336	30,261
Loss on disposal of equipment and intangible assets	70,143	66,686
Provision for bad debts	—	6,527
Stock-based compensation expense	480,532	598,779
Non-cash interest expense	250,471	7,271,151
Deferred compensation – phantom stock	—	(254,400)
Loss (gain) from change in fair value of derivative liability – warrants	(283,496)	2,513,476
(Increase) Decrease in:		
Accounts receivable	(44,665)	(35,957)
Inventories	23,061	(96,575)
Incentive refund receivable	(79,635)	92,430
Other current assets	(66,402)	10,020
Other assets	(293)	(4,290)
Increase (Decrease) in:		
Accounts payable and other liabilities	303,112	(90,552)
Accrued compensation	(42,532)	(24,810)
Deferred revenue	6,428	—
NET CASH USED IN OPERATING ACTIVITIES	(3,964,206)	(5,635,517)
CASH FLOWS FROM INVESTING ACTIVITIES		
Purchases of property and equipment	(93,002)	(131,842)
Purchases of intangible assets	(123,775)	(114,917)
NET CASH USED IN INVESTING ACTIVITIES	(216,777)	(246,759)
CASH FLOWS FROM FINANCING ACTIVITIES		
Advances (repayments) on short-term notes, net	(550,000)	550,000
Advances (repayments) of capital lease obligations	25,021	(30,158)
Proceeds from long-term loan	2,000,000	—
Proceeds from issuance of preferred stock	—	4,319,792
Proceeds from issuance of common stock	4,069,255	14,000
Common stock issuance fees and expenses	(638,174)	—
NET CASH PROVIDED BY FINANCING ACTIVITIES	4,906,102	4,853,634
NET INCREASE (DECREASE) IN CASH	725,119	(1,028,642)
CASH AT BEGINNING OF PERIOD	1,060,224	2,088,866
CASH AT END OF PERIOD	\$ 1,785,343	\$ 1,060,224

See notes to consolidated financial statements

XG SCIENCES, INC.
CONSOLIDATED STATEMENTS OF CASH FLOWS (cont.)
DECEMBER 31, 2016 AND 2015

SUPPLEMENTAL DISCLOSURE OF CASH FLOW INFORMATION:

Cash paid for interest	\$ 48,360	\$ 116,105
Value of preferred stock issued for AAOF capital lease obligations	\$ 342,686	\$ 342,686
Property and equipment additions under capital leases	\$ 38,998	\$ —
Reclassification of derivative liability warrants to equity	\$ 51,418	\$ —
Warrants issued with bridge financings	\$ 24,060	\$ —
Warrants issued with Dow financing	\$ 143,146	\$ —
Conversion of Series B stock to common stock	\$ 3,651,533	\$ —
Conversion of convertible notes to preferred stock – Series A	\$ —	\$ 17,473,540

See notes to consolidated financial statements

XG SCIENCES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
DECEMBER 31, 2016 AND 2015

NOTE 1 — NATURE OF BUSINESS AND BASIS OF PRESENTATION

XG Sciences, Inc., a Michigan company located in Lansing, Michigan and its subsidiary XGS IP, LLC (“we”, “us”, “our”, or the “Company”) manufactures graphene nanoplatelets made from graphite, using a proprietary manufacturing process to split natural flakes of crystalline graphite into very small and thin particles. These nanoplatelets are then used in products like battery electrodes, thin sheets, films, inks and coatings that we sell to other companies. We also sell our xGnP[®] graphene nanoplatelets in the form of bulk powders or dispersions to other companies for use as additives to make composite and other materials with specially engineered characteristics. Additionally, we license our technology to other companies in exchange for royalties and other fees.

Basis of Presentation

The accompanying consolidated financial statements have been prepared in accordance with accounting principles generally accepted in the United States of America (“US GAAP”). All normal adjustments considered necessary for a fair presentation have been included.

The consolidated financial statements include the accounts of XG Sciences, Inc. and our wholly-owned subsidiary, XGS IP, LLC. We operate as one reportable segment. All intercompany accounts, transactions and profits have been eliminated in consolidation.

Liquidity

We have historically incurred losses from operations and we may continue to generate negative cash flows as we implement our business plan. Our consolidated financial statements are prepared using US GAAP as applicable to a going concern, which contemplates the realization of assets and liquidation of liabilities in the normal course of business.

As of December 31, 2016, we had cash on hand of \$1,785,343 and at March 28, 2017 cash on hand of \$1,138,157 and currently available funds of \$3,000,000 under the Dow Facility, which we believe is sufficient to fund our operations through October 2017. We believe that we will need an additional approximately \$1 million to sustain us for the next 12 months for which we have a commitment from a shareholder. Our financial projections show that we may need to raise an additional \$15 million or more before we are capable of achieving sustainable cash flow from operations. We intend that the primary means for raising such funds will be through our IPO, the additional \$3 million of currently available funds under the Dow Facility (see note 7), and up to an additional \$5 million of proceeds from the Dow Facility after we have raised \$10 million of additional equity capital in the period beginning on November 1, 2016. There can be no assurance that we will be able to raise additional equity capital in the IPO or in subsequent equity offerings or that the terms and conditions of any future financings will be workable or acceptable to us and our stockholders.

In the event we are unable to fund our operations from existing cash on hand, operating cash flows, additional borrowings or raising equity capital, we may be forced to reduce our expenses, slow down our growth rate, or discontinue operations. Our consolidated financial statements do not include any adjustments relating to the recoverability and classification of recorded asset amounts or the amounts and classification of liabilities that might be necessary should we be unable to continue as a going concern.

NOTE 2 — SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Use of Estimates

US GAAP requires management to make estimates, judgments and assumptions that affect the reported amounts of assets, liabilities, revenues and expenses, together with amounts disclosed in the related notes to the consolidated financial statements. Actual results and outcomes may differ from management’s estimates, judgments and assumptions. Significant estimates, judgments and assumptions used in these consolidated financial statements include, but are not limited to, those related to revenues, accounts receivable and related allowances, contingencies, useful lives and recovery of long-term assets, income taxes, and the fair values of stock-based compensation, warrants, and derivative financial instrument liabilities. These estimates, judgments, and assumptions are reviewed periodically and the effects of material revisions in estimates are reflected in the financial statements prospectively from the date of the change in estimate.

Revenue Recognition

We recognize revenues when (a) the price is fixed or determinable, (b) persuasive evidence of a sales arrangement exists, (c) the service is performed or delivery has occurred and (d) collectability of the resulting receivable is reasonably assured.

XG SCIENCES, INC.
NOTES TO CONSOLIDATED FINANCIAL STATEMENTS
DECEMBER 31, 2016 AND 2015

We recognize product revenues when products are shipped to customers. At that time, product ownership and risk have transferred to the customer and we have no further obligations. We record product sales at net selling prices that are reflective of discounts and allowances. Shipping and handling costs are recorded as a component of direct costs, as are shipping and handling costs billed to customers.

Revenue related to licensing agreements is recorded upon substantial performance of the terms of the licensing contract. In the case of licensing arrangements that involve up-front payments, revenue is recorded when management determines that the appropriate terms of the contract have been fulfilled. For example, this may occur when technology has been transferred via written documents or, if training is involved, whenever all contracted training has occurred. In the case of licenses where product delivery is also embedded in the deliverable, a portion of revenue would be recognized when products are delivered.

In the case of licensing arrangements that involve ongoing royalties based on sales of products produced with our technology, royalty income is recorded when received or, in the case of minimum royalties due, in the period when due.

Grant contract revenue is recognized over the life of the contracts as the services are performed.

Amounts received in excess of revenues earned are recorded as deferred revenue.

Cost of Products Sold

We use a standard cost system to estimate the direct costs of products sold. Direct costs include estimates of raw material costs, packaging, freight charges net of those billed to customers, and an allocation for direct labor and manufacturing overhead. Because of the nature of our production processes, there is a substantial fixed manufacturing expense requirement that represents the ongoing cost of maintaining production facilities that are not directly related to products sold, so we use a "full capacity" allocation of overhead based on an estimate of what product costs would be if the manufacturing facilities were operating on a full-time basis and producing products at the designed capacity. This estimate involves estimating both the level of expenses as well as production amounts as if the manufacturing facility were operating on a continuous, three-shift, production basis.

The remaining costs of operating the Company's manufacturing facilities are recorded as Unallocated Manufacturing Expenses. Manufacturing expense includes the costs of operating our manufacturing facilities including personnel costs, rent, utilities, indirect supplies, depreciation, and related indirect expenses. Manufacturing expenses are expensed as incurred.

Research and Development

Research and development expenses include the compensation costs of research personnel, laboratory rent and utilities, depreciation of laboratory equipment, travel and laboratory supplies and are expensed as incurred.

General and Administrative Expense

General and administrative expenses include the compensation costs of personnel, rent, utilities, supplies, travel, depreciation of office equipment, and related expenses not included in other expense categories. General and administrative expenses also include non-cash compensation expenses related to the Company's deferred compensation, management incentive bonus, and employee stock option programs.

Sales and Marketing Expense

Sales and marketing costs include compensation, travel, and business development expenses including free samples provided to customers. These costs are expensed as incurred. Product marketing allowances are recorded at the estimated out of pocket cost necessary to produce the product in the period the allowance is granted. Advertising costs are expensed at the time they are incurred and were not material for the years ended December 31, 2016 and 2015.

Income Taxes

It is our policy to provide for uncertain tax positions and the related interest and penalties based upon management's assessment of whether a tax benefit is more likely than not to be sustained upon examination by tax authorities. To the extent that the probable tax outcome of these uncertain tax position changes, such changes in estimate will impact the income tax provision in the period in which such determination is made. At December 31, 2016, we believe we have appropriately accounted for any unrecognized tax benefits. We are not aware of any uncertain tax positions. To the extent we prevail in matters for which a liability for an unrecognized tax benefit is established or we are required to pay amounts in excess of the liability, our effective tax rate in a given financial statement period may be affected.

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We account for income taxes using an asset and liability approach. The difference between the financial statement and tax basis of assets and liabilities is determined annually. Deferred income tax assets and liabilities are computed for those differences that have future tax consequences using the currently enacted tax laws and rates that apply to the periods in which they are expected to affect taxable income. Income tax expense is the current tax payable or refundable for the period plus or minus the net change in the deferred tax assets and liabilities. The deferred tax effects of state and local income taxes are considered immaterial and have not been recorded. Valuation allowances are established, if necessary, to reduce deferred tax assets to the amount that is estimated to be realized. Because of the uncertainty related to future realization of deferred tax assets (see Note 14), we have established a valuation allowance equal to one hundred percent of the deferred tax assets.

Net Income (Loss) Per Common Share

We compute net income or (loss) per share in accordance with Financial Accounting Standards Board (“FASB”) Accountings Standards Codification (“ASC”) Topic 260: Earnings Per Share. Under the provisions of ASC 260, basic net income (loss) per share is computed by dividing the net income (loss) available to common stockholders by the weighted average number of common shares outstanding during the period. Diluted net loss per share is computed using the weighted average number of shares outstanding during the applicable period, plus the effect of potentially dilutive securities. Potentially dilutive securities consist of shares potentially issuable pursuant to stock options and warrants as well as shares that would result from full conversion of all outstanding convertible securities. These potentially dilutive securities were 3,594,582 and 2,857,839 as of December 31, 2016 and 2015 and are excluded from diluted net loss per share calculations because they are anti-dilutive. As a result, for the years ended December 31, 2016 and 2015, basic and diluted net loss per share was the same.

Accounts Receivable and Allowance for Doubtful Accounts

Accounts receivable are stated at the amount management expects to collect from outstanding balances. Management provides for probable uncollectible amounts through a provision for bad debt expense and an adjustment to a valuation allowance based on their assessment of the current status of individual accounts. Balances that are still outstanding after management has used reasonable collection efforts are written off through a charge to the allowance account and a credit to accounts receivable.

Statements of Cash Flows

For the purposes of the statements of cash flows, we consider all highly liquid investments purchased with an original maturity of three months or less to be cash equivalents.

Fair Value of Financial Instruments and Concentrations of Credit Risk

Financial instruments, which potentially subject the Company to concentrations of credit risk, consist principally of cash and accounts receivable. The Company places its cash with FDIC insured financial institutions. Although such balances may exceed the federally insured limits at certain times, in the opinion of management they are subject to minimal risk.

The Company has established policies for extending credit to customers based upon factors including the customers’ credit worthiness, historical trends and other information. Nonetheless the collectability of accounts receivable is affected by regional economic conditions and other factors.

Inventory

Inventory consists of raw materials, work-in-process and finished goods, all of which are valued at standard cost, which approximates average cost.

Property and Equipment

Property and equipment are recorded at cost, net of accumulated depreciation and amortization. Property and equipment generally includes purchases of items with a cost greater than \$3,000 and a useful life greater than one year. Depreciation and amortization are computed on the straight line basis over the estimated useful lives of the assets. Leasehold improvements are amortized over the shorter of the related lease terms or their estimated useful lives.

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We periodically review the estimated useful lives of property and equipment. Changes to the estimated useful lives are recorded prospectively from the date of the change. Upon retirement or sale, the cost of the assets disposed of and the related accumulated depreciation are removed from the accounts and any resulting gain or loss is included in the statement of operations. Repairs and maintenance costs are expensed as incurred.

Recoverability and Impairment of Long-Lived Assets

We review our long-lived assets for recoverability if events or changes in circumstances indicate the assets may be impaired. This circumstance exists when the carrying amount of the asset exceeds the sum of the undiscounted cash flows expected to result from its use and eventual disposition. At December 31, 2016, we believe the carrying value of our long-lived assets is recoverable.

Intangible Assets

We have entered into a License Agreement with Michigan State University under which we have licensed certain intellectual property in the form of patents and patent applications and invention disclosures. We are responsible for managing the patent process and ongoing filings for this licensed intellectual property and for bearing the cost thereof. We capitalize all costs related to the acquisition and ongoing administration of this License Agreement and we amortize these costs over 15 years or the remaining life of the License Agreement, whichever is shorter.

In addition to the costs of managing in-licensed intellectual property, we also file for patent protection for inventions and other intellectual property generated by our employees. All patents are evaluated for filing in international markets on a case-by-case basis, and are filed in the United States and in selected international markets as considered appropriate. All external legal and filing costs related to patent applications, patent filings, ongoing registrations, overseas filings, and legal opinions related thereto are capitalized as intangible assets at cost and amortized over a period of 15 years from the date incurred, or the remaining useful life of the associated patent, whichever is shorter.

The cost of royalties or minimum payments specified under the license agreement for in-licensed technology is expensed as incurred.

We have also out-licensed certain of our intellectual property to licensees under terms and conditions of license agreements that specify the intellectual property licensed, the territory, and the type of license. In exchange for these licenses, we have recorded revenues associated with the initial granting of the license and expect to receive royalties based on sales of products produced under these licenses. License revenues are recorded to reflect our performance of requirements under these license agreements. In addition, we record royalty revenues from licensees at the time they are earned.

Our intangible assets are assessed for impairment on an annual basis. As part of this process, we take into account the cash flows which we have received from licensing certain of our intellectual property as well as our plans to continue licensing our intellectual property as part of our ongoing business model.

Incentive Refund

As of December 31, 2016 and 2015, we had \$165,635 and \$86,000 of incentive refunds due from the Michigan Economic Growth Authority under a five-year agreement signed on January 19, 2011. These incentive payments are awarded annually based on a pre-determined formula relating to the number of jobs created, average compensation, and total payroll and benefits for jobs created by XG Sciences in Michigan. These refunds are paid in cash during the year following the refund period. There is no requirement to have taxable income to receive these incentive payments.

Stock-Based Compensation

We recognize compensation expense in our statement of operations for all share-based option and stock awards, based on estimated grant-date fair values.

We estimate the grant-date fair value of stock-based compensation awards using the Black-Scholes option valuation model. This model is affected by the estimated value of our common stock on the date of the grant as well as assumptions regarding a number of highly complex and subjective variables. These variables include the expected term of the option, the exercise price, expected risk-free rates of return, the expected volatility of our common stock, and expected dividend yield, each of which is more fully described below. The assumptions for the estimated value of our common stock, expected term and expected volatility are the assumptions that most significantly affect the grant date fair value.

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Estimated Value of our Common Stock: The estimated fair value of the Company's common stock was based on a number of objective and subjective factors, including external market conditions affecting the Company's industry sector, the prices at which the Company sold shares of convertible preferred stock, and the superior rights and preferences of securities senior to the Company's common stock at the time. The Company used the option pricing method, utilizing the back-solve method, which is a form of the market approach defined in the American Institute of Certified Public Accountants, or AICPA, *Audit and Accounting Practice Aid Series: Valuation of Privately Held Company Equity Securities Issued as Compensation*, used to estimate the fair value of common stock. The valuation methodology included estimates and assumptions that require the Company's judgment. Once our common stock becomes publicly traded, it will no longer be necessary for us to estimate the fair value of our common stock for new awards.

Expected Term: Because we have limited experience related to the exercise of employee stock options, we use the simplified method permitted by SEC Staff Accounting Bulletin Topic 14 to estimate the expected term of the options. The expected term of an option is estimated to be equal to the mid-point between the vesting and expiration dates of the option.

Risk-free Interest Rate: We base the risk-free interest rate used on the implied yield at the grant date of U.S. Treasury zero-coupon issues with a term approximately equal to the expected term of the stock-based award being valued.

Expected Stock Price Volatility: Because we were a private company with very limited stock sales history, we use a blended average weekly volatility of certain publicly-traded peer companies. We believe that the use of this blended average peer volatility is reflective of market conditions and a reasonable indicator of our expected future volatility.

Dividend Yield: Because we have never paid a dividend and do not expect to begin doing so in the foreseeable future, we have assumed a 0% dividend yield in valuing our stock-based awards.

The grant-date fair value of the award is recognized as expense over the requisite service period using the straight-line method.

Fair Value Measurements

FASB ASC 820: "Fair Value Measurements and Disclosures" defines fair value as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. ASC 820 also establishes a fair value hierarchy which requires an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value. The standard describes three levels of inputs that may be used to measure fair value:

Level 1: Quoted prices in active markets for identical assets or liabilities.

Level 2: Inputs other than quoted prices included within Level 1 which are either directly or indirectly observable.

Level 3: Inputs to the valuation methodology are unobservable and significant to the fair value measurement.

A financial instrument's level within the fair value hierarchy is based on the lowest level of any input that is significant to the fair value measurement. Our derivative liabilities are classified as Level 3 within the fair value hierarchy because they were valued using other unobservable inputs. The valuation technique used to measure fair value of the derivative liabilities is based on a lattice model with significant assumptions and inputs determined by the Company. A lattice model was used to estimate the fair value of the derivative liabilities because management believes it reflects all the assumptions that market participants would likely consider including early exercise of the warrants. The fair value of the derivative liabilities will be significantly influenced by the fair value of our common stock, stock price volatility and the risk-free interest components of the lattice technique.

The following is a reconciliation of the beginning and ending balances for liabilities measured at fair value on a recurring basis using significant unobservable inputs (Level 3) during the years ended December 31, 2016 and 2015:

	2016	2015
Balance at January 1	\$ 8,235,163	\$ 5,000,752
Warrants issued with private placement of Series B Preferred Stock	—	660,378
Warrants issued with preferred stock sold under preemptive rights	—	7,881
Warrants issued with bridge financing	—	52,676
Warrants reclassified to equity	(51,418)	—
(Gain) Loss recognized in earnings	(283,496)	2,513,476
Balance at December 31	<u>\$ 7,900,249</u>	<u>\$ 8,235,163</u>

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Derivative Financial Instruments

We do not use derivative instruments to hedge exposures to cash flow, market or foreign currency risk. The terms of convertible preferred stock and convertible notes that we issue are reviewed to determine whether or not they contain embedded derivative instruments that are required by ASC 815: "Derivatives and Hedging" to be accounted for separately from the host contract, and recorded at fair value. In addition, freestanding warrants are also reviewed to determine if they achieve equity classification. Certain stock warrants that we have issued did not meet the conditions for equity classification and are classified as derivative instrument liabilities measured at fair value. The fair values of these derivative liabilities are revalued at each reporting date, with the change in fair value recognized in earnings. See Note 9 for additional information.

Beneficial Conversion Feature of Preferred Stock

Equity instruments that contain a Beneficial Conversion Feature (BCF) are recorded as a deemed dividend to the holders of the convertible equity instruments. The deemed dividend amount is recorded as an increase to additional paid-in capital. For the year ended December 31, 2015, we recorded a deemed dividend of \$2,214,856 related to the adjustment of the conversion price of the Series A Preferred Stock from \$12.00 to \$6.40 per share. This resulted in a BCF due to the new conversion price being lower than the value of the underlying common stock. See Note 9 for additional information related to the BCF resulting from our Series A Preferred Stock.

Recent Accounting Pronouncements

In May 2014, the Financial Accounting Standards Board, or FASB, issued Accounting Standards Update No. 2014-09, *Revenue From Contracts With Customers*, or ASU 2014-09. Pursuant to this update, an entity should recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. The amendments in this update are currently effective for annual reporting periods beginning after December 15, 2016, including interim periods within that reporting period, and are to be applied retrospectively, or on a modified retrospective basis. Early application is not permitted. In July 2015, the FASB approved a one year deferral of the effective date for annual reporting periods beginning after December 15, 2017 with early adoption permitted for annual periods beginning after December 15, 2016. We are currently evaluating the impact of adopting ASU 2014-09 on our consolidated financial statements.

In August 2014, FASB issued ASU 2014-15, *Disclosure of Uncertainties about an Entity's Ability to Continue as a Going Concern*, or ASU 2014-15. ASU 2014-15 explicitly requires a company's management to assess an entity's ability to continue as a going concern, and to provide related footnote disclosures in certain circumstances. The new standard will be effective in the first annual period ending after December 15, 2016, although early application is permitted. We believe the adoption of this standard will have no material impact on our consolidated statements of financial position, results of operations or cash flows.

In April 2015, the FASB issued ASU No. 2015-03, *Simplifying the Presentation of Debt Issuance Costs*, or ASU 2015-03. ASU 2015-03 requires debt issuance costs to be presented in the balance sheet as a direct deduction from the carrying value of the associated debt liability, consistent with the presentation of a debt discount. The standard also aligns the GAAP presentation with International Financial Reporting Standards and will remedy the long-standing conflict with the guidance in FASB Concepts Statement No. 6, Elements of Financial Statements, which indicates that debt issuance costs do not meet the definition of an asset, because they provide no future economic benefit. ASU No. 2015-03 is effective for financial statements issued for fiscal years beginning after December 15, 2015, and interim periods within those fiscal years. Early adoption is permitted for financial statements that have not been previously issued. The new guidance will be applied on a retrospective basis. The adoption of this guidance during the year ended December 31, 2016 did not have a material impact on our consolidated balance sheets.

On February 24, 2016, the FASB issued ASU No. 2016-02, *Leases*, requiring lessees to recognize a right-of-use asset and a lease liability on the balance sheet for all leases with the exception of short-term leases. For lessees, leases will continue to be classified as either operating or finance leases in the income statement. Lessor accounting is similar to the current model but updated to align with certain changes to the lessee model. Lessors will continue to classify leases as operating, direct financing or sales-type leases. The effective date of the new standard for public companies is for fiscal years beginning after December 15, 2018 and interim periods within those fiscal years. Early adoption is permitted. The new standard must be adopted using a modified retrospective transition and requires application of the new guidance at the beginning of the earliest comparative period presented. We are currently evaluating the effect that the updated standard will have on our consolidated financial statements and related disclosures.

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On March 30, 2016, the FASB issued ASU No. 2016-09, Improvements to Employee Share-Based Payment Accounting, which simplifies various aspects related to the accounting and presentation of share-based payments. The amendments require entities to record all tax effects related to share-based payments at settlement or expiration through the income statement and the windfall tax benefit to be recorded when it arises, subject to normal valuation allowance considerations. All tax-related cash flows resulting from share-based payments are required to be reported as operating activities in the statement of cash flows. The updates relating to the income tax effects of the share-based payments including the cash flow presentation must be adopted either prospectively or retrospectively. Further, the amendments allow the entities to make an accounting policy election to either estimate forfeitures or recognize forfeitures as they occur. If an election is made, the change to recognize forfeitures as they occur must be adopted using a modified retrospective approach with a cumulative effect adjustment recorded to opening retained earnings. The effective date of the new standard for public companies is for fiscal years beginning after December 15, 2016 and interim periods within those fiscal years. Early adoption is permitted. We believe the adoption of this standard will have no material impact on our consolidated statements of financial position, results of operations or cash flows.

In July 2015, the FASB issued ASU No. 2015-11, (“ASU 2015-11”), Inventory (Topic 330): Simplifying the Measurement of Inventory. ASU 2015-11 requires an entity to measure in scope inventory at the lower of cost and net realizable value. The amendment does not apply to inventory that is measured using last-in, first-out or the retail inventory method. For public entities, ASU 2015-11 is effective for fiscal years beginning after December 15, 2016, and interim periods within those fiscal years, and is to be applied prospectively. We do not expect the adoption of this standard will have a material effect on our consolidated statements of financial position, results of operations, or cash flows.

With the exception of the standards discussed above, we believe there have been no new accounting pronouncements effective or not yet effective that have significance, or potential significance, to our Consolidated Financial Statements.

JOBS Act

In April 2012, the Jumpstart Our Business Startups Act of 2012, or the JOBS Act, was enacted. Section 107 of the JOBS Act provides that an “emerging growth company,” or EGC, can take advantage of the extended transition period for complying with new or revised accounting standards. Thus, an EGC can delay the adoption of certain accounting standards until those standards would otherwise apply to private companies. We have irrevocably elected not to avail ourselves of this extended transition period and, as a result, we will adopt new or revised accounting standards on the relevant dates on which adoption of such standards is required for other public companies.

We are in the process of evaluating the benefits of relying on other exemptions and reduced reporting requirements under the JOBS Act. Subject to certain conditions, as an EGC, we intend to rely on certain of these exemptions, including exemptions from the requirement to provide an auditor’s attestation report on our system of internal controls over financial reporting pursuant to Section 404(b) of the Sarbanes-Oxley Act and from any requirement that may be adopted by the Public Company Accounting Oversight Board regarding mandatory audit firm rotation or a supplement to the auditor’s report providing additional information about the audit and the financial statements, known as the auditor discussion and analysis. We will remain an EGC until the earlier of: the last day of the fiscal year in which we have total annual gross revenues of \$1.0 billion or more; the last day of the fiscal year following the fifth anniversary of the date of the completion of our IPO; the date on which we have issued more than \$1.0 billion in nonconvertible debt during the previous three years; or the date on which we are deemed to be a large accelerated filer under the rules of the SEC.

NOTE 3 — INVENTORY

Inventory is carried at the lower of cost or market. Cost is determined using the first-in, first-out method for raw material and finished goods inventory. Market is based on current replacement cost for raw materials and net realizable value for finished goods. Raw materials include all components used in the production of our finished goods, which are our four major product lines, bulk materials, energy storage materials, thermal management materials and inks and coatings.

The following amounts were included in inventory at the end of the period:

	Year Ended December 31	
	2016	2015
Raw materials	\$ 45,964	\$ 46,660
Finished goods	160,009	182,374
Total	\$ 205,973	\$ 229,034

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NOTE 4 — PROPERTY, PLANT AND EQUIPMENT

Property, plant and equipment as of December 31 consist of the following:

	Depreciable life (years)	2016	2015
Plant and equipment not yet placed in service		\$ 49,200	\$ 49,200
Leasehold improvements	5-10	399,060	399,060
Lab equipment	3-7	871,512	871,512
Production and other equipment	3-7	5,809,937	5,835,226
Software	3	39,144	39,144
		<u>7,168,853</u>	<u>7,194,142</u>
Less accumulated depreciation and amortization		(4,282,432)	(3,440,894)
Net property, plant and equipment		<u>\$ 2,886,421</u>	<u>\$ 3,753,248</u>

Depreciation and amortization expense on property and equipment, including leased assets, for the years ended December 31, 2016 and 2015, was \$908,895 and \$964,382, respectively. These amounts are included as part of our statement of operations in Cost of Goods Sold, Research and Development, and General and Administrative Expenses - \$756,029, \$119,481, \$33,385 and \$783,153, \$146,970, \$34,259, respectively in 2016 and 2015.

Property and equipment under capital leases included above consists of the following at December 31:

	2016	2015
Lab equipment	\$ 73,202	\$ 160,202
Production and other equipment	991,887	986,230
	<u>1,065,089</u>	<u>1,146,432</u>
Less accumulated depreciation	(386,314)	(297,336)
Net property, plant and equipment under capital leases	<u>\$ 678,775</u>	<u>\$ 849,096</u>

NOTE 5 — INTANGIBLE ASSETS

Intangible assets and related accumulated amortization as of December 31, 2016 and 2015 are as follows:

	Carrying Amount	Less Accumulated Amortization	Net Carrying Amount
Licenses	\$ 137,533	\$ (75,140)	\$ 62,393
Patents	481,733	(69,526)	412,207
Trademarks, other intangibles	5,698	(2,279)	3,419
Balance, December 31, 2016	<u>\$ 624,964</u>	<u>\$ (146,945)</u>	<u>\$ 478,019</u>
Licenses	\$ 137,533	\$ (65,522)	\$ 72,011
Patents	383,496	(47,524)	335,972
Trademarks, other intangibles	5,698	(1,892)	3,806
Balance, December 31, 2015	<u>\$ 526,727</u>	<u>\$ (114,938)</u>	<u>\$ 411,789</u>

Amortization expense of \$38,337 and \$30,261 was recorded for the years ended December 31, 2016 and 2015, respectively. Amortization expense for the next five years is estimated to be approximately \$42,000 annually.

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NOTE 6 — ACCOUNTS PAYABLE AND OTHER CURRENT LIABILITIES

As of December 31, 2016 and 2015, our accounts payable and other current liabilities consisted of the following:

	2016	2015
Accounts payable	\$ 731,518	\$ 404,146
Accrued compensation	144,134	186,665
Accrued expenses	11,100	12,900
401(k) employer contribution expense	78,005	100,466
Accounts payable and other liabilities	<u>\$ 964,757</u>	<u>\$ 704,177</u>

NOTE 7 — SECURED CONVERTIBLE NOTES, WARRANTS AND FINANCING AGREEMENTS

2013 AAOF, Knox and XGS II Financings

On March 18, 2013 we entered into a series of agreements with our former Chief Executive Officer, Michael R. Knox and two private funds: Aspen Advance Opportunity Fund, LP (“AAOF”) and XGS II, LLC (“XGS II”). These agreements were amended and restated on July 12, 2013 to provide for expanded financing commitments from AAOF and XGS II. Under these agreements, they agreed to provide financing to the Company in the form of Secured Convertible Notes and a provision that a portion of the AAOF funding could be funded under lease financing arrangements.

AAOF had a financing commitment of a minimum of \$6 million and, at the option of AAOF, a maximum of \$10 million, of which a maximum of \$3 million could be provided in the form of lease financing. XGS II agreed to provide a minimum of \$250,000 and, at the option of XGS II, a maximum of \$750,000. The agreements provided for Mr. Knox to lend the Company \$700,000, to be funded by converting advances he had made under a revolving line of credit.

All of the funding with the exception of the Knox financing, was scheduled according to minimum financing commitments on calendar dates ranging from the time the agreements were executed to a period of eighteen months into the future. With the exception of any lease financing, the financings provided by Knox, AAOF, and XGS II takes the form of Secured Convertible Notes with identical terms and provisions.

On January 15, 2014, we consolidated the Secured Convertible Notes issued in 2013 to AAOF and XGS II, together with accrued interest, into a single note for each lender with terms and conditions similar to the original notes. We also increased the XGS II optional funding level to \$1 million and extending the optional financing periods for both AAOF and XGS II through the end of 2014. The previously issued Certificate of Designation of Series A Convertible Preferred Stock was also amended to clarify the conditions related to Mandatory Conversion into Common Stock upon listing of the Company’s stock on a Qualified National Exchange and to add a provision that would exempt holders of Series A from future mandatory financing participation.

The Secured Convertible Notes issued under these agreements bear interest at 12% per annum and have a due date of March 18, 2018. We had the option to accrue the interest payments through December 31, 2014 and add it to the principal of the notes. After December 31, 2014, the note holder had the option of receiving ongoing interest payments: 1) in cash; 2) in the form of Series A Preferred Stock at a price per share equal to the then-effective Series A Original Issue Price (\$12 per share); 3) in the form of any other series of Preferred Stock outstanding at the time interest is due; or 4) they could elect to accrue the interest and add it to the balance of the Note. Beginning January 1, 2015, Mr. Knox chose to receive ongoing interest payments in cash, while all other note holders continue to have interest accrued and added to the balance of their Notes. These Notes are secured by all of the assets, both tangible and intangible, of the Company. Further, they are convertible into Series A Preferred Stock, at the option of the holder at a conversion price of \$12 per share.

The embedded conversion feature in the Secured Convertible Notes was analyzed under ASC 815 to determine if it achieved equity classification or required bifurcation as a derivative instrument. The Company’s common stock is not publicly traded so there is no mechanism outside the notes that would permit the holder to achieve net settlement and the underlying shares are not readily convertible to cash. Accordingly, the embedded conversion feature does not meet the definition of a derivative, and therefore, does not require bifurcation from the host instrument. Certain default put provisions were not considered to be clearly and closely related to the host instrument but we concluded that the value of these default put provisions was *de minimus*. We reconsider the value of the default put provisions each reporting period to determine if the value becomes material to the financial statements.

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In conjunction with the sale of the Secured Convertible Notes to AAOF and XGS II, Stock Warrants to purchase an aggregate of 447,916 shares of Series A Preferred Stock were issued that vest as the financing occurs at a rate of one Stock Warrant for every \$24.00 funded. On January 15, 2014, we exchanged the existing warrants for new warrants to purchase 916,666 shares of Series A Preferred Stock. In accordance with the terms of the amendment, the previously-issued Stock Warrants associated with these financings vest as the financings occur at a rate of one Stock Warrant for every \$12.00 funded. The Stock Warrants have an exercise price of \$12.00 per share and are indexed to Series A Preferred Stock which contains a feature that requires adjustment of the exercise price of the Preferred Stock if the Company issues any Common Stock or common stock equivalents for a price less than the exercise price in effect immediately before the issuance. The Stock Warrants expire on the earlier of i) March 18, 2023 or ii) the acquisition of the Company by another entity.

The Stock Warrants required derivative liability accounting because the conversion price reset protection terms in the underlying Series A Preferred Stock was not consistent with the definition for financial instruments indexed only to a company's own stock. As such, they are required to be marked to fair value each reporting period.

After recording the Stock Warrants at fair value, a determination was made as to whether, in accordance with ASC 470, there was a BCF associated with the Secured Convertible Notes. A BCF is a non-detachable conversion feature that is in-the-money at the commitment date. An option is in-the-money if its effective conversion price is less than the current fair value of the share. For purposes of measuring a BCF, the effective conversion price is based on the proceeds allocated to the convertible debt instrument after considering allocations to detachable warrants.

The cash proceeds from the AAOF and XGS II financings were allocated first to the derivative liabilities resulting from the Stock Warrants, at their fair values, then to the beneficial conversion feature, with the residual allocated to the host debt contracts. The amount allocated to the derivative liabilities and the BCF was recorded as a discount on the Secured Convertible Notes and was being amortized to interest expense over the remaining term of the notes using the effective interest method.

As of December 31, 2015, AAOF and XGS II had purchased \$10,000,000 of secured convertible notes and also provided \$1,026,091 in equipment lease financing. Because the lease commitments exceed the \$1,000,000 initial commitment by \$26,091, AAOF increased the maximum potential funding from \$11,000,000 to \$11,026,091. All 833,332 Stock Warrants issued in conjunction with the Secured Convertible Notes and all 83,334 Stock Warrants issued in conjunction with the lease commitments, were vested as of December 31, 2015.

No payments were made on the secured convertible notes and as mentioned in further detail below, on December 31, 2015, the AAOF and XGS II Notes were converted into Series A Preferred Stock.

2014 Samsung Financing and Warrants

On January 15, 2014, we sold \$3,000,000 of Secured Convertible Notes to SVIC No. 15 New Technology Business Investment L.L.P, a subsidiary of the Samsung Group ("Samsung"). These notes had terms and conditions that were substantially similar to those previously issued to Knox, AAOF, and XGS II. In connection with the sale of the notes, the Company issued to Samsung a total of 100,000 Stock Warrants with a term of 4 years that are exercisable into shares of Series A Preferred Stock at a price of \$12.00. These Stock Warrants vest in four installments on the first, second, third and fourth anniversary of the issuance of the Stock Warrants according to the following formula: On each anniversary, the warrant vests according to the ratio of total Samsung payments to us during the previous twelve-month period divided by 250. Thus, the warrants will vest proportionately in relation to the first \$25 million, or fraction thereof, that Samsung pays, in cash, to us over the four years beginning January 15, 2014. Samsung payments are defined as future total cash payments, including licensing, royalties and product purchases but not joint development or purchase of Secured Convertible Notes. As of December 31, 2016, no payments had been made by Samsung and none of the Stock Warrants associated with the Samsung note had vested. If and when Samsung provides funding to the Company in the future, the Stock Warrants will be measured at fair value and expensed at that time.

Conversion of Secured Convertible Notes

In conjunction with the Series B Private Placement, the holders of the Secured Convertible Notes agreed to convert their notes into Series A Preferred Stock upon the earlier of i) the Company raising at least \$12 million through the sale of securities or ii) December 31, 2015, contingent on the Company raising at least \$2 million through the sale of securities by that date. All the Secured Convertible Note agreements converted into shares of Series A Preferred Stock on December 31, 2015 in accordance with the terms of the agreements. The following table reflects the outstanding balances of the Notes on the date of conversion:

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	<u>AAOF</u>	<u>XGS II</u>	<u>KNOX</u>	<u>SAMSUNG</u>	<u>Total</u>
Face value of notes at issuance	\$ 9,000,000	\$ 1,000,000	\$ 700,000	\$ 3,000,000	\$ 13,700,000
Accrued interest on face value	2,520,232	310,068	166,721	776,519	3,773,540
Amount due – December 31, 2015	<u>\$ 11,520,232</u>	<u>\$ 1,310,068</u>	<u>\$ 866,721</u>	<u>\$ 3,776,519</u>	<u>\$ 17,473,540</u>
Shares of Series A Convertible Preferred Stock Issued	<u>960,019</u>	<u>109,172</u>	<u>72,226</u>	<u>314,709</u>	<u>1,456,126</u>

On conversion, the fair value of the notes and accrued interest was credited to the capital accounts. The remaining unamortized discount of approximately \$5.1 million was recorded as interest expense. Total interest expense of \$ 7,154,905 was recognized for the year ended December 31, 2015.

Bridge Financings

From December 31, 2015 through April 7, 2016, we entered into private placement bridge financings, executed using 15 separate short-term promissory notes totaling \$1,124,750 (the “Bridge Financings”). Seven of these notes were executed by three board members. The Bridge Financings had maturity dates ranging from June 30, 2016 through December 31, 2016 and the interest rate was 8%.

The investors in the Bridge Financings received common stock warrant coverage of 30% for investments made prior to December 31, 2015 with an exercise price of \$8.00 per share, and 20% coverage thereafter with an exercise price of \$10.00 per share.

The Company issued warrants indexed to 32,120 shares of common stock with a five year term and an exercise price of \$8.00 per share. During the period from closing of the offering and ending on the earlier of i) December 31, 2017 and ii) the date the Company consummates the sale of new securities resulting in gross proceeds of at least \$18 million, the warrant holders have the right to exchange their Warrants on a price per share basis into the new security on the relative price per share terms as the new securities are sold to the third party. Due to the Exchange Rights, the Warrants did not meet the conditions for equity classification and require classification as liabilities at fair value. The proceeds of the financing were allocated first to the derivative liabilities resulting from the Stock Warrants, at their fair value, with the residual allocated to the debt instrument as follows:

	<u>2015 Allocation</u>	<u>2016 Allocation</u>	<u>Total Bridge Financing Allocation</u>
Derivative liabilities- warrants	\$ 52,676	\$ 550,691	\$ 603,367
Bridge Financing Notes	497,324	24,059	521,383
Total allocated proceeds	<u>\$ 550,000</u>	<u>\$ 574,750</u>	<u>\$ 1,124,750</u>

During June 2016, we repaid i) outstanding principal of \$750,000 plus accrued interest of \$27,032 to the Bridge Financing investors. These investors, who are also members of the board of directors of the Company, used the proceeds from repayment of their notes, plus additional funds, to purchase 199,879 additional shares of the Company’s common stock for approximately \$1.6 million.

During December 2016, we repaid the remaining \$374,750 of outstanding principal plus accrued interest of \$21,253. Members of the board of directors and their affiliates provided \$800,000 of the principal for such Bridge Financings, and upon repayment they re-invested all of the principal plus an additional \$1,013,032 to purchase 226,629 shares of the Company’s common stock.

Dow Loan

In December 2016, we entered into a draw loan note and agreement (the “Dow Loan”) with The Dow Chemical Company (“Dow”) to provide up to \$10 million of secured debt financing to the Company at an interest rate of 5% per year, drawable at our request under certain conditions. We received \$2 million at closing, with \$3 million in additional funding available on or before December 1, 2017. After December 1, 2017, an additional \$5 million becomes available if we have raised \$10 million of equity capital after October 31, 2016.

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The Dow Loan is senior to most of our other debt, and is secured by the Company's assets (Dow is subordinate only to the capital leases with AAOF, see note 13). The loan does not mature until December 1, 2021, (subject to certain mandatory prepayments based on our equity financing activities). Interest is payable beginning January 1, 2017 although we may elect to capitalize interest through January 1, 2019. Dow will receive warrant coverage of one share of common stock for each \$40 received by the Company, equating to 20% warrant coverage, with an exercise price of \$8.00 per share for the warrants issued at closing with the exercise price of future warrants subject to adjustment if the Company sells shares of common stock at a lower price. As of December 31, 2016, we issued 50,000 warrants to Dow which are exercisable on or before the expiration date of December 1, 2023.

The warrants meet the criteria for classification within stockholders' equity. The fair value of the warrants was determined using a lattice model with the following inputs: Stock price \$7.63, strike price \$8.00, equivalent volatility 38.38%, equivalent risk free rate 1.53%. The relative fair value of the warrants totaled approximately \$143,146 which was recorded as a debt discount and is being amortized to interest expense over the life of the loan. During the fiscal year ended December 31, 2016, amortization expense of \$5,266 was recognized resulting in a carrying value of \$1,862,120 for the Dow Loan as of December 31, 2016.

The Loan entitles Dow to appoint an observer to the Company's board of directors. They will maintain their observation right until the later of December 1, 2019 or when the amount of principal and interest outstanding under the Loan is less than \$5 million.

NOTE 8 — PRIVATE PLACEMENT AND PREEMPTIVE RIGHTS

Private Placement

In April 2015, we commenced a private placement offering of up to \$18,000,000 in Series B Units consisting of up to 1,125,000 shares of Series B Preferred Stock and warrants to purchase common stock at an offering price of \$16.00 per Series B Unit. As of December 31, 2016, we had sold 266,887 shares of Series B Convertible Preferred Stock and Warrants to purchase 222,262 shares of common stock, for aggregate gross proceeds of \$4,270,192.

The Series B Preferred Stock has a stated value of \$16.00 per share and is convertible, at the option of the holder, at a conversion price of \$16.00 per share, subject to adjustments for stock dividends, splits, combinations and similar events. The Warrants have an exercise price of \$16.00 per share and expire in 7 years. During the period from closing of the offering and ending on the earlier of i) December 31, 2017 and ii) the date the Company consummates the sale of new securities resulting in gross proceeds of at least \$18 million, the holder has the right to exchange their Series B Preferred Stock and Warrants on a price per share basis into the new security on the relative price per share terms as the new securities were sold to the third party.

The cash proceeds from the private placement were allocated first to the derivative liabilities resulting from the Stock Warrants, at their fair values. There was no BCF present so the residual was allocated to the Series B Preferred Stock, as follows:

	Allocation
Derivative liabilities – warrants	\$ 660,378
Series B Preferred Stock	3,609,814
Total allocated proceeds	\$ 4,270,192

The warrants issued in the private placement required derivative liability accounting and are required to be marked to fair value each reporting period. The initial fair value of the warrants was estimated using a binomial lattice model with the following assumptions:

Fair value of underlying stock	\$12.00
Equivalent risk free interest rate	0.91% – 1.03%
Expected term (in years)	7.00
Equivalent stock price volatility	30.47% – 31.22%
Expected dividend yield	—

Equivalent amounts reflect the net results of multiple modeling simulations that the lattice model applies to underlying assumptions. The expected volatility of the Company's stock was developed using historical volatility of a peer group for a period equal to the expected term of the Stock Warrants.

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The private placement Series B Unit offering was terminated on February 25, 2016. As a result of our IPO and pursuant to the exchange rights, holders of Series B Preferred Stock received the right to exchange each share of Series B Preferred Stock they owned into two shares of common stock. As of December 31, 2016, all holders of Series B Preferred Stock had exercised their Series B Exchange Rights, and as a result the Company issued 539,974 shares of restricted common stock in exchange for the 269,987 shares of Series B Preferred Stock that had been previously outstanding. All of the previously issued Series B Preferred Stock was cancelled. However, as of December 31, 2016, all of the warrants issued in connection with the Series B Units remain outstanding.

Preemptive Rights

On January 15, 2014, as part of our financing agreements with Samsung, AAOF and XGS II, we agreed to allow all shareholders to purchase one share of Series A Convertible Preferred Stock at a price of \$12 per share for every two shares of Series A Convertible Preferred Stock or Common Stock owned by the shareholder. In addition, for every two preemptive shares purchased, the Company issued the shareholder a warrant to purchase one additional share of Series A Convertible Preferred Stock with the same terms as the warrants issued to AAOF and XGS II. The Company also agreed to issue warrants with the same terms to those shareholders who exercised preemptive rights in October 2013. These preemptive rights expired on March 31, 2014.

Under the January 15, 2014 preemptive rights offering, 101,000 shares of Series A Preferred Stock were sold to existing stockholders at a price of \$12.00 per share. Stock Warrants indexed to 56,054 shares of Series A Preferred Stock were issued in conjunction with these stock purchases, including 5,554 warrants related to the preemptive rights exercised in October 2013. Proceeds of \$1,345,284 were allocated first to derivative liabilities-warrants at their fair value of \$316,366, a BCF of \$316,366 was recorded for the difference between the effective conversion price and the current fair value of the share, with the remaining \$712,522 being allocated to the Series B Preferred Stock.

As part of our private placement in April 2015, shareholders and holders of our convertible notes were provided the right to purchase their pro rata share of any class of stock that the Company sells or issues. The sale of Series B Preferred Stock in the April 2015 offering triggered the preemptive rights. This resulted in the issuance of additional Series B Units consisting of 3,100 shares of Series B Preferred Stock sold at a price of \$16.00 per share and warrants to purchase 2,635 shares of Common Stock. Proceeds of \$49,600 were allocated first to derivative liabilities-warrants at their fair value of \$7,881 with the remaining \$41,719 being allocated to the Series B Preferred Stock. There was no BCF associated with the April 2015 issuance.

As of December 31, 2016, the total number of Stock Warrants issued due to the preemptive rights offerings was 58,689.

NOTE 9 - DERIVATIVE LIABILITY WARRANTS

The Stock Warrants issued in conjunction with the convertible notes, the equipment financing leases, the 2015 private placement transaction and the preemptive rights are derivative liabilities which require re-measurement at fair value each reporting period. Liability classification is required because the conversion price reset protection terms in the underlying Series A Convertible Preferred Stock, and the Exchange Rights are not consistent with the definition for financial instruments indexed only to a company's own stock. The initial value of the Stock Warrants issued as consideration for the equipment financing leases was recorded as a reduction of the capital lease obligation and is being amortized as part of the effective interest cost on the capital lease obligation (see Note 13).

The Bridge Financing Warrants issued in December 2015 provided the holder with the right to exchange their warrants on a price per share basis into a new security on the same relative price per share terms as any new securities sold to third parties resulting in gross proceeds of at least \$18,000,000. As a result of these exchange rights, the December 2015 Bridge Financing warrants did not achieve equity classification at inception and were recorded as derivative liabilities, at fair value. During the second quarter of 2016, the warrant holders agreed to waive their exchange rights at which time the warrants were reclassified to equity and \$51,418 of derivative liabilities related to such December 2015 Bridge Financing warrants was reclassified to equity.

Shares indexed to derivative liabilities as of December 31, 2016 and 2015 were as follows:

	Type of shares indexed	Exercise Price	2016	2015
Warrants issued with Secured Convertible Notes	Series A PS	\$ 6.40	833,333	833,333
Warrants issued with equipment financing leases	Series A PS	\$ 6.40	83,333	83,333
Warrants issued with Series A preemptive rights	Series A PS	\$ 6.40	56,054	56,054
Warrants issued with Series B preemptive rights	Common	\$ 16.00	2,635	2,635
Warrants issued with Series B Units	Common	\$ 16.00	222,262	222,262
Warrants issued with Bridge Financings	Common	\$ 8.00	—	20,625
Total shares indexed to derivative liabilities			1,197,617	1,218,242

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The following table summarizes the fair value of the derivative liabilities as of December 31, 2016 and 2015:

	2016	2015
Warrants issued with Secured Convertible Notes	\$ 6,554,160	\$ 6,743,997
Warrants issued with equipment financing leases	655,418	674,397
Warrants issued with preemptive rights	443,790	457,265
Warrants issued with 2015 Series B Units	246,881	306,828
Warrants issued with Bridge Financings	—	52,676
Total derivative liabilities	\$ 7,900,249	\$ 8,235,163

The Company estimated the fair value of their warrant derivative liabilities as of December 31, 2016 and December 31, 2015, using a lattice model and the following assumptions:

	2016	2015
Fair value of underlying stock	\$7.63 – \$12.64	\$7.63 – \$12.64
Equivalent risk free interest rate	1.27% – 1.46%	1.06% – 1.39%
Expected term (in years)	5.33 – 7.04	5.01 – 8.05
Equivalent stock price volatility	37.44% – 37.92%	38.00% – 38.61%
Expected dividend yield	—	—

The value of the warrants is estimated using a binomial lattice model. Equivalent amounts reflect the net results of multiple modeling simulations that the lattice model applies to underlying assumptions. Because the Company is not publicly traded on a national exchange or to our knowledge, an over-the-counter market, the expected volatility of the Company's stock was developed using historical volatility for a peer group for a period equal to the expected term of the warrants. The fair value of the warrants will be significantly influenced by the fair value of our common stock, stock price volatility, and the risk-free interest components of the lattice technique.

Changes in the fair value of Derivative Liabilities, carried at fair value, are reported as "Change in fair value of derivative liability — warrants" in the Statement of Operations, and were as follows:

	Year ended December 31,	
	2016	2015
Warrants issued with Secured Convertible Notes	\$ 189,837	\$ (2,459,830)
Warrants issued with equipment financing leases	18,979	(245,986)
Warrants issued with preemptive rights	13,475	(161,211)
Warrants issued with 2015 Series B Units	59,947	353,551
Warrants issued with Bridge Financings	1,258	—
Total Derivative Gain (Loss)	\$ 283,496	\$ (2,513,476)

NOTE 10 — CONVERTIBLE PREFERRED STOCK

Series A Convertible Preferred Stock

The Company is authorized to issue up to 3,000,000 shares of Series A Convertible Preferred Stock ("Series A Preferred"). Each share of the Series A Preferred, which has a liquidation preference of \$12.00 per share, is convertible at any time, at the option of the holder, into one share of Common Stock at the lower of: (a) \$12.00 per share, or (b) 80% of the price at which the Company sells any equity or equity-linked securities in the future. The Series A Preferred also contains typical anti-dilution provisions that provide for adjustment of the conversion price to reflect stock splits, stock dividends, or similar events. The Series A Preferred is subject to mandatory conversion into Common Stock upon the listing of the Company's Common Stock on a Qualified National Exchange.

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When the Company issued Warrants for \$8.00 per share in conjunction with the December 2015 Bridge Financing, the conversion price of the Series A Preferred reduced from \$12.00 to \$6.40 (80% of \$8.00). The repricing of the Series A Preferred resulted in a beneficial conversion feature of approximately \$2.21 million which was recorded as a deemed dividend.

Series B Convertible Preferred Stock

As of December 31, 2016, 1,500,000 shares have been designated as Series B Convertible Preferred Stock (“Series B Preferred”), of which none were issued and outstanding. Each share of the Series B Preferred, which has a liquidation preference of \$16 per share, is convertible at any time, at the option of the holder, into one share of Common Stock at \$16 per share. The Series B Preferred also contains typical anti-dilution provisions that provide for adjustment of the conversion price to reflect stock splits, stock dividends, or similar events. Each share of Series B Preferred is subject to mandatory conversion into common stock at the then-effective Series B conversion rate upon the public listing by the Company of its Common Stock on a Qualified National Exchange. However, the Series B Preferred is not subject to the mandatory conversion until all outstanding Convertible Securities are also converted into common stock.

Holders of the Series B Preferred Stock have the right to exchange their Series B Units on a price per share basis into new securities on the relative price per share terms as new securities sold to a third party on the earlier of i) December 31, 2017 and ii) the date the Company consummates the sale of new securities resulting in gross proceeds of at least \$18 million. As discussed in further detail in Note 8, as of December 31, 2016, all holders of Series B Preferred Stock have exercised their exchange rights and had exchanged all their Series B Preferred Stock for shares of restricted common stock. The Series B Preferred ranks senior to all other equity or equity equivalent securities of the Company other than those securities which are explicitly senior or pari passu in rights and liquidation preference to the Series B Preferred and pari passu with the Company’s Series A Preferred.

The Series A and B Preferred are not redeemable for cash and the Company concluded that they are more akin to equity-type instruments than debt-type instruments. Accordingly, the embedded conversion option in each agreement is clearly and closely related to an equity-type host and the conversion option does not require classification and measurement as a derivative financial instrument. Therefore, the securities meet the conditions for stockholders’ equity classification.

NOTE 11 — INCENTIVE STOCK OPTION PLAN

We have established an incentive stock option plan (the “Plan”) under which the Company may grant key employees and directors options to purchase common stock of the Company at not less than fair market value as of the grant date. Options for up to 600,000 shares may be awarded under the Plan. Each option is exercisable into one share of common stock of the Company. The Plan expires in December 2017. The fair value of the options granted was estimated on the dates of grant using the Black Scholes option-pricing model. As of December 31, 2016 and 2015, respectively, 369,750 and 419,750 option shares have been granted cumulatively at the end of each year. Vesting of the options ranges from immediately to 20% per year, with most options vesting on a straight-line basis over a three or four year period from the date issued. See discussion of CEO options below. Rights to exercise the options vest immediately upon a change in control of the Company or termination of the employee’s continuous service due to death or disability. The options expire at various dates through October 2023.

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The following table shows the stock option activity during the years ended December 31, 2016 and 2015:

	2016		2015	
	Number Of Options	Weighted Average Exercise Price	Number Of Options	Weighted Average Exercise Price
Options outstanding at beginning of year	419,750	\$ 12.00	464,750	\$ 12.05
Changes during the year:				
Granted – at market price	—	12.00	30,000	12.00
Expired	(50,000)	13.20	(75,000)	12.00
Options outstanding at end of year	369,750	11.89	419,750	12.04
Options exercisable at end of year	268,565	11.86	190,080	12.00
Weighted average fair value exercise price of options granted during the year		\$ 0		\$ 12.00

Costs incurred in respect of stock based compensation for employees and directors, for the years ended December 31, 2016 and 2015 were \$480,532 and \$598,779, respectively. Unrecognized compensation cost as of December 31, 2016 was \$381,009, which amount is expected to be recognized over approximately 32 months.

As of December 31, 2016, none of the currently exercisable stock options had intrinsic value. The intrinsic value of each option share is the difference between the fair market value of our common stock and the exercise price of such option share to the extent it is “in-the-money”. Aggregate intrinsic value represents the value that would have been received by the holders of in-the-money options had they exercised their options on the last trading day of the year and sold the underlying shares at the closing stock price on such day. The intrinsic value calculation is based on the assumed market value of our common stock on December 31, 2016 of \$7.63 per share. There were no in-the-money options outstanding and exercisable as of December 31, 2016, since the exercise prices of the stock options outstanding and expected to vest were all greater than the fair value of our common stock.

The following table presents changes in the number of non-exercisable options during 2016:

Non-exercisable options	Number Issued	Weighted Average Exercise Price
Total non-exercisable options outstanding – December 31, 2015	229,670	\$ 12.08
Options cancelled	(35,000)	\$ 13.20
Options vested	(93,485)	\$ 12.00
Total non-exercisable options outstanding – December 31, 2016	101,185	\$ 12.00

The Company hired a new Chief Executive Officer who commenced his employment on January 6, 2014. As part of his compensation, on January 6, 2014, he was awarded 220,000 stock options, with an exercise price of \$12 per share. Of the total option award, 160,000 options vest over the four year period ending January 6, 2018. The grant date fair value of these options was \$987,648, which is expected to be recognized over the four year vesting period. The remaining 60,000 options are subject to certain performance targets being met. As of December 31, 2016 and 2015, \$41,352 and \$17,070 of expense was recognized when achievement of certain targets was deemed probable.

The total fair value of options granted during the year ended December 31, 2015 was \$44,721. There were no options granted during 2016.

The fair value of the options granted in 2015 was estimated on the grant date using the Black-Scholes option-pricing model with the following assumptions:

	2015
Fair value of underlying stock	\$7.63
Expected option life	5.00 years – 5.18 years
Expected stock price volatility	36.12% – 36.36%
Risk free interest rate	1.35%
Expected dividend yield	0.00%

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The following table presents summary information concerning the options outstanding as of December 31, 2016:

Exercise prices	Number Outstanding	Number Exercisable	Weighted Average Remaining Contractual Life (Years)
\$ 8.00	10,000	10,000	.92
\$ 12.00	359,750	258,565	4.92
	<u>369,750</u>	<u>268,565</u>	<u>5.84</u>

NOTE 12 — STOCK WARRANTS

In addition to the warrants described in Note 9, which are accounted for as derivative liabilities, we had 42,694 common stock warrants that were issued in 2012 and prior years which are accounted for as equity instruments. During the period from July 2014 to July 2015, 30,294 of these warrants expired unexercised and 1,400 of the warrants were exercised in May 2015. The remaining 11,000 warrants have exercise prices ranging from \$8.00 to \$12.00 and expire at various dates through 2027.

The following table summarizes the warrants outstanding at December 31, 2016, all of which are exercisable:

Date Issued	Expiration Date	Exercise Price	Number of Warrants
7/1/2009	7/1/2019	\$ 8.00	6,000
10/8/2012	10/8/2027	\$ 12.00	5,000
			<u>11,000</u>

NOTE 13 — CAPITAL LEASES

As of December 31, 2016 and 2015, we have capital lease obligations to AAOF (see Note 7) and other lessors as follows:

	December 31, 2016	December 31, 2015
Capital lease obligations	\$ 449,368	\$ 682,564
Unamortized warrant discount	(65,595)	(149,594)
Net obligations	383,773	532,970
Short-term portion of obligations	(268,667)	(178,487)
Long-term portion of obligations	<u>\$ 115,106</u>	<u>\$ 354,483</u>

In connection with the lease agreements with AAOF, we issued to them preferred stock warrants with an initial fair value of \$156,043 and \$147,496 in 2015 and 2014, respectively (see Note 7). The initial fair value has been accounted for as a discount on the capital lease obligation and will be amortized as part of the interest expense on the leases. As discussed in Note 9, the warrants are accounted for as derivative instrument liabilities at fair value.

Our AAOF capital lease obligations are four year leases starting on January 1, 2014 and January 1, 2015. The effective interest rates on the leases are 50% and 32% for the leases executed in 2015 and 2014, respectively. The present value of the lease payments are more than 90% of the fair value of the equipment and therefore the leases were capitalized.

Our other capital leases expire at various dates in 2018, have average effective interest rates of 0% and contain bargain purchase options that allow us to purchase the leased property for a minimal amount upon the expiration of the lease term.

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Future minimum lease payments under capital lease obligations are as follows:

For the year ending December 31:	
2017	\$ 362,184
2018	<u>140,148</u>
Total future minimum lease payments	502,332
Less amount representing interest	<u>(118,559)</u>
Present value of future minimum lease payments	383,773
Less current maturities	<u>(268,667)</u>
Obligations under capital leases – long term	<u>\$ 115,106</u>

Property and equipment acquired under capital lease agreements is pledged as collateral to secure the performance of the future minimum lease payments above.

NOTE 14 — INCOME TAXES

Deferred tax assets (liabilities) consist of the following at December 31:

	2016	2015
Current:		
Other temporary differences	\$ 75,000	\$ 10,000
Non-current:		
Net operating loss carry forwards	12,985,000	9,955,000
Tax depreciation in excess of book depreciation	(230,000)	(220,000)
Research and development credits	<u>560,000</u>	<u>490,000</u>
Net deferred tax asset	13,390,000	10,235,000
Deferred tax valuation allowance	<u>(13,390,000)</u>	<u>(10,235,000)</u>
Net deferred tax asset	<u>\$ —</u>	<u>\$ —</u>

Net operating loss carry forwards of \$38,200,000 and \$33,180,000 exist at December 31, 2016 and 2015, respectively.

The primary difference between the net operating loss carry forwards and the accumulated deficit arises from certain stock option, warrants and other debt and equity transactions that are considered permanent differences. These losses were incurred in the years 2006 through 2016 and will expire between 2026 and 2036 and their utilization may be limited if we experience significant ownership changes. The Company has not conducted a full IRC Section 382 analysis to determine if a reduction in net operating loss carry forwards is required due to ownership changes. The analysis has not been undertaken due to the financial burden it would cause and changes, if any, resulting in a reduction to the deferred tax asset and related valuation would have no impact on the deferred tax asset or expense recognized. The research and development credits will expire between 2028 and 2036. A rate of 40% has been used to calculate the deferred tax assets and liabilities based on the expected effective tax rate, net of applicable credits, upon reversal of the differences above. A valuation allowance has been established against the entire deferred tax asset at December 31, 2016 and 2015. The valuation allowance is considered a significant estimate subject to material change in the near term.

Below is a reconciliation of the statutory federal income tax rate to our effective tax rate for the fiscal years ended December 31, 2016 and 2015:

	2016	2015
Federal tax provision	34.0%	34.0%
State tax provision	6.0%	6.0%
Valuation allowance	<u>(40.0)%</u>	<u>(40.0)%</u>
	<u>0.0%</u>	<u>0.0%</u>

We file income tax returns in the U.S. federal jurisdiction and in Michigan. Tax regulations within each jurisdiction are subject to the interpretation of the related tax laws and regulations and require significant judgment to apply. Beginning in 2017 we will begin filing under the corporate income tax (CIT) versus the Michigan Business Tax (MBT) structure. Net operating losses incurred in 2016 and prior will not carry forward to the CIT tax structure, accordingly all losses are considered a permanent timing difference for state deferred tax calculations.

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For federal and state purposes, we have open tax years for all years in which we have filed tax returns. We are not currently subject to any ongoing income tax examinations.

NOTE 15 — CUSTOMER, SUPPLIER, COUNTRY AND PRODUCT CONCENTRATIONS

Grants and Licensing Revenue Concentration

Two grantors accounted for 77% and 14% respectively of total grant revenue in 2016. In 2015 one grantor accounted for 100% of the revenue. The company's licensing revenue in both 2016 and 2015 came from one licensor.

Product Concentration

For 2016, we had concentrations of product revenue from one product that was greater than 10% of total product revenues. Revenue from one of the Company's graphene nanoplatelets materials, Grade C 300 m²/g – HP, was 24%. For 2015, we had concentrations of revenue from two products that were each greater than 10% of total revenues, Grade M 5µm was 11% and Grade C 750 m²/g was 12%. We attempt to minimize the risk associated with product concentrations by continuing to develop new products to add to our portfolio.

Customer Concentration

For 2016 we had one customer whose purchases accounted for 24% of total product revenues. In 2015 we had another customer that represented 12% of total product revenues. At December 31, 2016, there was one customer who had an accounts receivable balance greater than 10% of our outstanding receivable balance, at December 31, 2015 there were four customers who each had an accounts receivable balance greater than 10% of our outstanding receivable balance.

Country Concentration

We sell our products on a worldwide basis. International revenues in both 2016 and 2015 were 56% of total product revenues. All of these sales are denominated in U.S. dollars.

One country (South Korea) other than the United States accounted for approximately 21% and 12% of total product revenue in the years ended December 31, 2016 and 2015, respectively.

Suppliers

We buy raw materials used in manufacturing from several sources. These materials are available from a large number of sources. A change in suppliers has no material effect on the Company's operations. We did not have any purchases to one supplier that was more than 10% of total purchases in either 2016 or 2015.

NOTE 16 — RELATED PARTY TRANSACTIONS AND COMMITMENTS

We have a licensing agreement for exclusive use of patents and pending patents with Michigan State University (MSU), a stockholder via the MSU Foundation. During 2016 and 2015, we incurred \$50,000 each year for royalties for these licenses. We have also entered into product licensing agreements with certain other stockholders. No royalty expenses have been recognized related to these agreements during 2016 and 2015.

We entered into an employment agreement with our CEO during December 2013. The agreement calls for an annual salary of \$275,000. In addition, this officer will receive an aggregate of 220,000 options to purchase common stock at \$12 per share. The options have a life of 8 years provided the employee remains employed by the Company. The options vest as follows: 160,000 over a 48 month period with 40,000 options vesting on the first anniversary of the agreement and the balance over the remaining 36 months; 40,000 vesting over a provisional time based schedule and 20,000 vest based on certain performance requirements. The agreement has no termination date but may be terminated by either party at any time. If the Company terminates the agreement without cause it will be liable for 6 months of severance pay.

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In 2016, 2015, and 2014, POSCO, one of our shareholders, has a contractual obligation to pay us a minimum of \$100,000 per year to license certain technologies we license from MSU. This obligation is due annually on February 28 of the following year. We recorded this license revenue at a rate of \$25,000 per quarter for the years ended December 31, 2016 and 2015. POSCO is disputing that they are obligated to pay the royalties. This case is being arbitrated. An allowance in the amount of \$150,000 has been recorded at December 31, 2016 to reflect an estimate of what portion of the 2014, 2015 and 2016 royalties may not be collectible. The accrued royalty and allowance are netted together and reflected in other current assets on the consolidated balance sheets.

On March 18, 2013, the Company entered into financing arrangements with two private funds (AAOF and XGS II) that were formed for the sole purpose of investing in the Company by two investors affiliated with ASC-XGS, LLC, a stockholder of the Company. During 2013, these two funds purchased \$4,503,847 of secured convertible notes and also provided \$635,770 in equipment lease financing. In 2014, these two funds purchased \$5,500,000 of secured convertible notes and also provided \$390,321 in equipment lease financing. No payments have been made on the secured convertible note and the balance due, including interest, was converted to Series A Preferred Stock on December 31, 2015.

During the year ended December 31, 2015, Michael R. Knox was paid \$254,000 under the terms of a phantom stock agreement.

During the year ended December 31, 2015, and during the second quarter of 2016, we issued 28,560 and 14,280 shares of Series A Preferred Stock, respectively to AAOF as payment for lease financing obligations under the terms of a Master Leasing Agreement.

In April 2015, we commenced a private placement offering of up to \$18,000,000 in Series B Units consisting of up to 1,125,000 shares of Series B Preferred Stock and warrants to purchase common stock at an offering price of \$16.00 per Unit. Each of Steven Jones and Arnold Allemang invested \$250,000 in the offering of Series B Units.

On December 31, 2015, we issued notes ("December Notes") and warrants ("December Warrants") to Mr. Allemang, Jones and Pendell, each of whom is currently a member of the Board of Directors. The December Notes matured on June 30, 2016 and the December Warrants have a five year term and a strike price of \$8.00. Each of Steven Jones, Arnold Allemang, and Dave Pendell purchased December Notes for \$250,000, \$250,000 and \$50,000 respectively, which included December Warrants for 9,375, 9,375, and 1,875 shares of common stock, respectively. These notes were paid off in full as of June 30, 2016. Mr. Allemang and Mr. Jones and certain of their affiliates reinvested the proceeds from the repayment of the December Notes plus additional other funds into our IPO.

On March 9, 2016, we issued a promissory note and warrants to purchase 2,000 shares of common stock to Mr. Arnold Allemang, our Chairman of the Board. The note matured on December 31, 2016 and the warrants have a five year term and a strike price of \$10.00. Mr. Allemang purchased the note and warrants for \$100,000. The note was paid off in full as of June 30, 2016. Mr. Allemang reinvested the proceeds from the repayment of this note plus additional other funds into our IPO.

On March 25, 2016, we issued a promissory note and warrants to purchase 2,000 shares of common stock to Mr. Steven Jones, a member of our Board of Directors. The note matured on December 31, 2016 and the warrants have a five year term and a strike price of \$10.00. Mr. Jones purchased the note and warrants for \$100,000. The note was paid off in full as of June 30, 2016. Mr. Jones reinvested the proceeds from the repayment of this note plus additional other funds into our IPO.

On March 25, 2016, we issued a promissory note and warrants to purchase 1,000 shares of common stock to Mr. David Pendell, a member of our Board of Directors. The note matured on December 31, 2016 and the warrants have a five year term and a strike price of \$10.00. Mr. Pendell purchased the note and warrants for \$50,000. The note was paid off in full as of December 31, 2016. Mr. Pendell re-invested \$48,000 of these loan repayment proceeds into our IPO.

During the period from June - December 2016, Mr. Allemang, Jones and Pendell and certain of their affiliates invested the following amounts into our IPO and purchased the number of shares indicated.

	Purchase Dates	Amount Invested	Shares Purchased
Arnold Allemang and affiliates	June 23 – 28 and Sept. 30	\$ 965,000	120,625
Steven C. Jones and affiliates	June 24 – 27	\$ 748,000	93,500
David G. Pendell and affiliates	June 27 and Dec. 5	\$ 100,032	12,504
Total		\$ 1,813,032	226,629

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Pursuant to our registration statement, as of December 31, 2016, we have issued and sold 120,625 shares of common stock to entities controlled by Mr. Arnold Allemang, our Chairman of the Board, 93,500 shares of common stock to entities controlled by Mr. Steven Jones, our Director, and 12,504 shares of common stock to entities controlled by Mr. Dave Pendell, our Director.

In conjunction with a financing with AAOF, we and our stockholders listed therein entered into a Shareholder Agreement on March 18, 2013 that contains a number of specific provisions pertaining to the Board of Directors as well as individual Directors. On February 26, 2016, we amended the Shareholder Agreement.

Among other things, the Shareholder Agreement provides for certain voting and nomination rights to be calculated on the basis of "Full Conversion" stock ownership (under which calculation, all convertible notes, preferred shares, or other convertible equity securities are deemed converted into common stock) as follows:

- So long as AAOF or its affiliates own 10% of more of the aggregate outstanding Shareholder Stock (as defined in the Shareholder Agreement):
 - the size of the Board of Directors shall be set at seven individuals.
 - one person nominated by AAOF shall be elected to the Board of Directors.
 - two members of the Board of Directors, other than those nominated by AAOF, POSCO or Hanwha Chemical, shall qualify as independent Directors.
- So long as POSCO owns 10% of more of the aggregate outstanding Shareholder Stock, one person nominated by POSCO shall be elected to the Board of Directors. POSCO does not currently own at least 10% of the aggregate outstanding Shareholder Stock and therefore, there is no POSCO representative on the Board of Directors.
- So long as Hanwha Chemical owns 10% of more of the aggregate outstanding Shareholder Stock, one person nominated by Hanwha Chemical shall be elected to the Board of Directors. Hanwha does not currently own at least 10% of the aggregate outstanding Shareholder Stock and therefore, there is no Hanwha representative on the Board of Directors.

As of December 31, 2016, the ownership percentage of AAOF, as calculated for purposes of Director voting, required the stockholders bound by the Shareholder Agreement to vote for a Director nominated by AAOF. Mr. Jones is the AAOF representative to the Board pursuant to the terms of the Shareholder Agreement.

The Shareholder Agreement grants preemptive rights to shareholders and holders of convertible notes who are parties to the Shareholder Agreement. Pursuant to the terms therein, such shareholders and noteholders have the right to purchase their pro rata share of all shareholder stock that the Company may, from time to time, propose to sell, issue, or exchange after the date of the Shareholder Agreement, other than certain excluded stock which includes stock granted to employees or as merger consideration. Each shareholder's pro rata shares shall be equal to the ratio of (i) the aggregate number of shares of the Company's common stock on a fully diluted basis, owned by the such shareholder at the time of the delivery of a preemptive rights notice to (ii) the aggregate number of shares of Company's common stock on a fully diluted basis owned by all of the Company's shareholders at the time of the delivery of a preemptive rights notice.

The Shareholder Agreement may be amended or terminated by agreement (either generally or in a particular instance and either retroactively or prospectively), only with the written consent of (i) a majority of the Company's board of directors, and (ii) persons holding, in the aggregate, shares of Shareholder Stock representing at least sixty percent (60%) of the voting power of all shares of Shareholder Stock then held by Shareholders and their permitted assignees.

On February 26, 2016, the Shareholders Agreement was amended to provide that holders of Excluded Stock are not subject to the terms of the Shareholders Agreement. Excluded Stock means shares of common stock that are subject to a registration statement that has been filed with the SEC and has been declared effective, and, for the avoidance of any doubt, includes the 3,000,000 shares being offered under the IPO Registration Statement. This amendment took effect upon the effectiveness of our registration statement of our IPO Registration Statement.

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The Amendment to the Shareholder Agreement further clarifies that preemptive rights shall not apply to Excluded Stock (including, without limitation, the 3,000,000 shares being offered under the IPO Registration Statement), and amends the termination date of the Shareholders Agreement. Specifically, the Shareholder Agreement has been amended to provide that it continues in effect until (i) the date of the closing of a public offering of common stock pursuant to a registration statement filed with the SEC that is declared effective in which the Company receives gross proceeds of at least \$10,000,000, on which date it shall terminate in its entirety, unless the Shareholder Agreement is earlier terminated in accordance with its terms, or (ii) the date on which the Company's common stock is listed on the NASDAQ Stock Market of the New York Stock Exchange. As a result, in the event that the Company is unable to raise at least \$10,000,000 in our IPO, the Shareholder Agreement will continue to remain in effect and the larger shareholders described above will be entitled to continue to exercise their rights under such Shareholders Agreement, but purchasers of shares of common stock under this registration statement, if it is made effective, will not be required to adopt the Shareholders Agreement.

NOTE 17 — OPERATING LEASES

We lease our primary manufacturing facility, laboratory and administrative office under two separate operating leases expiring in December 2017 and March 2022. A second manufacturing facility is leased on a month to month basis. Total rent expense, including common area maintenance costs, was \$383,029 and \$387,159 during the years ended December 31, 2016 and 2015, respectively. Operating lease commitments for the next 5 years are as follows:

For the year ending December 31:	
2017	\$ 338,862
2018	\$ 226,422
2019	\$ 230,685
2020	\$ 235,023
2021	\$ 240,081

NOTE 18 — RETIREMENT PLAN

We maintain a defined-contribution 401(k) retirement plan covering substantially all employees (as defined by our Plan Document). Employees may make voluntary contributions to the plan, subject to limitations based on IRS regulations and compensation. The plan allows for an employer match contribution. The employer match expense was \$78,005 and \$93,582 for the years ended December 31, 2016 and 2015, respectively.

NOTE 19 — LETTER OF CREDIT

We are required by one of our lease agreements to maintain a letter of credit of approximately \$190,000 through February 2022. To support this letter of credit, we are required to maintain an equivalent cash deposit. As of December 31, 2016, there were no amounts outstanding on the letter of credit. The cash deposit is restricted and classified as a non-current asset. As of December 31, 2016 and 2015, the cash deposit for the letter of credit was \$195,499 and \$195,206, respectively.

NOTE 20 — SUBSEQUENT EVENTS

We are extending our IPO offering being conducted pursuant to a Registration Statement on S-1 (Registration No. 333-209131) (the "Registration Statement"). Pursuant to Post-Effective Amendment No. 3 to the Registration Statement, filed with the U.S. Securities and Exchange Commission (the "SEC") on January 10, 2017, the Offering will terminate on April 13, 2017 without an extension. Per SEC Rule 415 (a)(1)(ix), we are choosing to file an extension which will allow us to continue our IPO to a date not later than April 13, 2019. A post-effective amendment to the Registration Statement will be filed after the filing date of this report and before April 13, 2017.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURES

None

ITEM 9A. CONTROLS AND PROCEDURES

Evaluation of Disclosure Controls and Procedures

At the conclusion of the period ended December 31, 2016, we carried out an evaluation, under the supervision and with the participation of our management, including our Principal Executive Officer/Principal Financial Officer, of the effectiveness of the design and operation of our disclosure controls and procedures (as such term is defined in Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934 (the "Exchange Act")). Based upon that evaluation, our Principal Executive Officer/Principal Financial Officer concluded that as of December 31, 2016, our disclosure controls and procedures were effective and adequately designed to ensure that the information required to be disclosed by us in the reports we submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the applicable rules and forms and that such information was accumulated and communicated to our Principal Executive Officer/Principal Financial Officer, in a manner that allowed for timely decisions regarding required disclosure.

We do not expect that our disclosure controls and procedures will prevent all errors and all instances of fraud. Disclosure controls and procedures, no matter how well conceived and operated, can provide only reasonable, not absolute, assurance that the objectives of the disclosure controls and procedures are met. Further, the design of disclosure controls and procedures must reflect the fact that there are resource constraints, and the benefits must be considered relative to their costs. Because of the inherent limitations in all disclosure controls and procedures, no evaluation of disclosure controls and procedures can provide absolute assurance that we have detected all our control deficiencies and instances of fraud, if any. The design of disclosure controls and procedures also is based partly on certain assumptions about the likelihood of future events, and there can be no assurance that any design will succeed in achieving its stated goals under all potential future conditions.

Management's Annual Report on Internal Control over Financial Reporting

The Company's management is responsible for establishing and maintaining adequate internal control over financial reporting as defined in Rule 13a-15(f) of the Securities Exchange Act of 1934. The Company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with United States generally accepted accounting principles. Internal control over financial reporting includes policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the Company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with United States generally accepted accounting principles, and that receipts and expenditures of the Company are being made only in accordance with authorizations of management and directors of the Company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisitions, use or disposition of the Company's assets that could have a material effect on the financial statements.

Management assessed the effectiveness of the Company's internal control over financial reporting as of December 31, 2016. In making this assessment, management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO") in Internal Control-Integrated Framework published in 2013. Based on this assessment, and on those criteria, management concluded that the Company's internal control over financial reporting was not effective as of December 31, 2016 for the following reasons:

The Company's accounting department consists of a limited number of personnel which does not provide for an adequate segregation of duties and we do not have a chief financial officer.

In an effort to remediate the identified weaknesses and enhance our internal controls, we have initiated, or plan to initiate, the following measures:

Assuming we are able to secure additional working capital and as our business grows, we will create positions to segregate duties consistent with control objectives in our accounting department and will hire a CFO.

This annual report does not include an attestation report of the Company's 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.

Changes in Internal Controls over Financial Reporting

There were no changes in our internal control over financial reporting that occurred during our last fiscal quarter that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

ITEM 9B. OTHER INFORMATION

None.

PART III

ITEM 10. DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

Directors and Executive Officers of the Company

The following table sets forth the name and age of the Company's executive officers, Directors and significant employees as of the date of this filing. There are no family relationships among any of our executive officers or directors.

<u>Name</u>	<u>Age</u>	<u>Position(s)</u>
Philip L. Rose	54	Chief Executive Officer, President, Secretary, Treasurer & Director
Arnold A. Allemang	73	Chairman of the Board, Chairman of the Executive Committee, and member of the Audit and Compensation Committees
Ravi Shanker	52	Director and member of the Executive and Compensation Committees
Steven C. Jones	53	Director, AAOF representative to the Board, Chairman of the Audit, Nominating, and Corporate Governance Committees, member of the Executive and Compensation Committees
Michael Pachos	38	Director, Samsung representative on the Board and Audit Committee member
Dave Pendell	70	Director
Scott Murray	61	Vice President, Operations
Robert Privette	56	Vice President of Energy Markets
Liya Wang	59	Vice President of Research & Development

Biographies of Officers and Directors

Philip L. Rose, Ph.D.

Dr. Rose joined the Company in January 2014 and currently serves as our Chief Executive Officer, President, Secretary, Treasurer and is a Director of the Company. Dr. Rose has extensive international business management experience in the electronic and specialty materials markets. Prior to joining XG Sciences, he spent 4 years as President of SAFC Hitech, a \$100 million division of Sigma-Aldrich that makes precursors and performance materials for the LED, energy and display, and semiconductor markets. He also served concurrently for a period of time as CEO of Soulbrain-Sigma Aldrich based in South Korea and as an independent Director for Pixtronix, a company based in the Boston area. Before joining Sigma Aldrich, Dr. Rose spent almost 20 years with Rohm and Haas in various leadership positions in the semiconductor and flat panel display industries that include general management, mergers and acquisitions, business development and marketing. Dr. Rose has 7 years of experience living in Japan and South Korea and has travelled extensively in Asia over the past 15 years. Dr. Rose earned his Ph.D. in Physical Chemistry from Duke University and holds a B.S. in Chemistry from the University of Southern California and a certificate in Business Management from The Wharton School at the University of Pennsylvania. In light of the aforementioned experience qualifications, attributes and skills, we believe Dr. Rose is qualified to serve as a director.

Arnold A. Allemang

Mr. Allemang has served as a Director of XG Sciences since March 2010 and Chairman of the Board since January 2016. Mr. Allemang was employed by Dow, headquartered in Midland, Michigan for 43 years. Mr. Allemang joined Dow in 1965 in Freeport, Texas. After five years in the Solvents Development Lab, he transferred to Stade, Germany. In 1972, he returned to the United States for various technical and managerial assignments. Mr. Allemang was named unit manager for Freeport's Chlorinated Ethanes in 1981, and two years later assumed the same role for Light Hydrocarbons and Acetylene. He transferred to Terneuzen, The Netherlands, in 1984 to become production manager for Light Hydrocarbons I, and in 1986 became responsible for process control and engineering functions. In 1988, he returned to Freeport to manage the site's hydrocarbons production, and moved to Midland in 1989 as Director of Technology Centers. Mr. Allemang was named Manufacturing General Manager for Dow Benelux in 1992, and in early 1993 was named regional vice president, Manufacturing and Administration, Dow Benelux. He was named vice president, Manufacturing Operations Dow Europe in late 1993. In August 1995, Mr. Allemang was named vice president, Operations, which included global manufacturing and engineering activities. He then became executive vice president of Dow in 2000, and was named senior advisor in 2004. In March 2008, he retired as a Dow employee. Mr. Allemang was elected to the Dow Board of Directors in July 1996 and served until May 2015. Mr. Allemang received a bachelor's degree in chemistry from Sam Houston State University in Huntsville, Texas. In light of the aforementioned experience qualifications, attributes and skills, we believe Mr. Allemang is qualified to serve as a director.

Ravi Shanker, Ph.D.

Dr. Shanker has served as a Director of XG Sciences since March 2014. Since 1991, Dr. Shanker has been employed by Dow in various capacities. Dr. Shanker is currently the General Manager of the Lightweighting Platform, a position he has held since March 2015. From March 2013 until March 2015, Dr. Shanker was the Global Business Advisor at Dow. In this role, Dr. Shanker provided strategic insight into the portfolio of businesses that include Dow Epoxy Intermediates, Polymers and Systems. Previous to this role, he served as the president and CEO of Dow Kokam. Dr. Shanker led the team that created the Dow Kokam joint venture, an advanced battery manufacturing business, and has many years of experience building, growing and running businesses with Dow. Dr. Shanker first joined Dow in 1991 and has grown Dow's business via new product and new business development. Starting in the research department, he focused on developing new manufacturing processes. Dr. Shanker also supported the office of the CEO in strategy development for near- and long-term business opportunities in emerging geographies. He was then appointed Global Business Director of Specialty Plastics in the Performance Products Portfolio. Before assuming his role with Dow Kokam, Dr. Shanker served as Corporate Director of Ventures and Business Development, where he incubated a portfolio of innovative business opportunities for Dow, driving many to commercialization. Dr. Shanker holds a Ph.D. in Mechanical Engineering from the University of Delaware and B. Tech in Mechanical Engineering from B.I.T. Sindri, in India. He also has an MBA from the University of Houston. In light of the aforementioned experience qualifications, attributes and skills, we believe Dr. Shanker is qualified to serve as a director.

Steven C. Jones

Mr. Jones has served as a Director of XG Sciences since March 2014. Mr. Jones is the Chairman of Aspen Capital Group, LLC, a private equity firm headquartered in Naples, FL, which manages private equity funds. Mr. Jones also serves as the President of Aspen Capital Advisors, LLC, which is Aspen Capital Group's investment management subsidiary. Aspen believes its highest value is to be a "hands on" partner with the management teams of portfolio investments to help them achieve their growth objectives by bringing capital, strategic partners, customers, additional management and other business advice. Mr. Jones has substantial expertise in developing and financing emerging growth companies. In addition to his involvement with XG Sciences, Mr. Jones serves on the Boards of NeoGenomics, Inc. (NASDAQ: NEO) ("NEO") and T3 Communications, Inc., a business communications company. Mr. Jones has also served as Executive Vice President of Finance and Chief Compliance Officer of NEO since November 2009 and February 2013, respectively, and previously served as Chief Financial Officer from October 2003 until November 2009. In December 2014, he was appointed to serve as a Director of XG Sciences by the Aspen Advanced Opportunity Fund, LP in connection with their investment in XGS. Prior to his career in structured private equity, among other positions, Mr. Jones was a Vice President in the Telecommunications, Media and Technology Investment Banking Group of Merrill Lynch & Co in New York and was the chief executive officer or chief financial officer of various public and private companies. Mr. Jones has a BS degree in Computer Engineering from the University of Michigan and an MBA from the Wharton School of the University of Pennsylvania. In light of the aforementioned experience qualifications, attributes and skills, we believe Mr. Jones is qualified to serve as a director.

Michael Pachos

Michael Pachos is a Principal at Samsung Ventures. He joined Samsung in 2008, first working out of the Seoul headquarters, and then transferring to their Silicon Valley offices in 2012, and has been a director at Samsung since early 2015. He focuses on Consumer, Display and Energy related investments. Prior to joining Samsung Ventures, Mr. Pachos worked in the Samsung Group's Global Strategy Group ("GSG"). GSG was established under the Chairman's Office to address strategic and operational issues at the CEO level of Group companies. He has worked on projects involving M&A, convergence and digital media, and channel strategy. Before joining Samsung, Mr. Pachos was a CPU architect at DEC, Compaq/HQ and Intel. He is also a co-founder of Global Velocity; an enterprise security related Hardware Company. Mr. Pachos earned his MBA at the Wharton School and completed law related coursework. He holds his B.S. degree in Computer Engineering from Washington University in St. Louis. In light of the aforementioned experience qualifications, attributes and skills, we believe Mr. Pachos is qualified to serve as a director.

Dave Pendell

David Pendell is a principal of the Aspen Advanced Opportunity Fund. From June, 2009, Mr. Pendell has served as General Partner and Officer of AdvancedStage Capital LLC, which he owns and operates. Since January, 2011 Mr. Pendell has served as General Partner and Officer of ASC Lease Income LLC. From May of 2013 until February 2016, Mr. Pendell served as a Board Observer of the Company until he was appointed to the board of directors in February 2016. In addition, Mr. Pendell has served and continues to serve on the board of directors of ERP Maestro (since June of 2013) and the board of directors of Strategic Health Services Inc. (since April of 2015) and has worked with Aspen Advanced Opportunity Fund and Veterans Capital Fund. Mr. Pendell was responsible for the successful launch and subsequent profitable sale of five start-up entities in which he was the lead entrepreneur and numerous other investments where he served as a lead investor/mentor/coach. Predominantly, Mr. Pendell led the growth of Pendell Printing, Inc. from a small print firm of less than \$1MM in sales in 1971 to over \$85MM in 1998 when the sale of the business was completed. Past management roles include Chairman of the Board/President of Pendell Printing Inc.; co-founder of Envision Inc., a graphic solutions enterprise; President and CEO of Baustert Engineering, Inc., a software business; co-founder of Ecoland, a timber/real estate development company; founder of The Earth Generation, an environmental education publisher; and co- Founder of Fuel Oil News, a publication for the home heating industry. Mr. Pendell also actively participates in the Michigan Angel Fund and Tamiami Angel Fund I and II. He received his BS in Psychology from Central Michigan University in 1969. In light of the aforementioned experience qualifications, attributes and skills, we believe Mr. Pendell is qualified to serve as a director.

Scott Murray

Scott Murray has extensive experience as a senior operations executive and is skilled in business management, product and process development, and strategic leadership of growth of businesses. These experiences ranged from small, privately owned companies to Fortune 500 Companies. Mr. Murray has been the Vice President of Operations of the Company since October 2007. Prior to his tenure with the Company, Mr. Murray was with Motor Wheel Corporation for 17 years having held positions in engineering, marketing, and plant management. He served in the positions of Chief Engineer and Director of Manufacturing prior to the leaving to form a new company. Mr. Murray founded and was CEO of Uretech International Inc. from 1995 through 2004. He directed all process, product, marketing, and commercial activities for that company. As a manufacturer of specialty chemicals and urethane products, Uretech International supplied products to many markets including the automotive, medical, and office furniture industries as well as a variety of industrial applications. Most recently, as Director of Development for McKechnie Automotive, Mr. Murray was responsible for the technical and market introduction of a new product line and the startup of a manufacturing operation for that product line in Kentucky. Mr. Murray is a graduate of Michigan Tech University, where he earned a degree in Metallurgical Engineering. As a member of the Society of Automotive Engineers and the American Iron and Steel Institute served on numerous task forces and technical committees for professional organizations in the automotive industry. He is a past Committee Chairman for the American Society of Non-Destructive Testing. Mr. Murray is a registered Professional Engineer and holds a Six Sigma Black Belt certification.

Robert Privette

Robert Privette is a technical business executive with more than 25 years of hands-on experience in technology development and commercialization related to fuel cells, batteries and other energy related devices. He has experience in managing large, complex programs with the US Department of Energy, DARPA, the US Army and the US Navy focusing on technology development, product design, new manufacturing process, and market-based product qualification testing with multiple corporate, university and laboratory partners. Mr. Privette was hired as the Vice President, Energy Markets for the Company in May 2011. In his current role as Vice President, Energy Markets, he is responsible for developing product markets and sales of graphene nanoplatelets and associated value-added XGS products for energy storage and conversion applications. Prior to joining XGS he was Director for Product Development at Energy Conversion Device (ECD) - Ovonic Fuel Cell Company. In this role, he led the development and execution of the company business plan and technology roadmap for a 5 kW fuel cell product for stationary and portable power applications. Before joining ECD in 2006, he worked for Degussa, a large German materials and specialty chemicals supplier where he led customer product qualification programs developed for North American customers focused on accelerating market introduction and commercialization of state-of-the-art fuel cell membrane electrode assemblies and fuel processing catalysts for automotive and stationary fuel cell power applications. During 1989 through 2000 he worked for Babcock & Wilcox where he led a US Department of Energy development program for a 50 kW on-board gasoline fuel processor prototype for fuel cell vehicles. He received his MS degree in Mechanical Engineering from Purdue University in 1986 and has completed MBA coursework.

Liya Wang, Ph.D.

Dr. Liya Wang leads the research and development activities of the Company for a variety of applications. Previously, Dr. Wang was Principal Scientific Director at CIC Energigune in Spain from 2010 to 2012. There he helped build a world-class new energy research center and led the development of advanced batteries and capacitors. Prior to arriving at CIC Energigune, Dr. Wang was Director of Emerging Technologies from 2006 to 2010 at A123 Systems, a global Li-ion battery manufacturer based in US. He led the development of new generations of Li-ion battery cathodes and the transition of technologies into production. From 2003 to 2006, Dr. Wang worked as R&D Director at Pacific Industrial Development Corp and coordinated the development of nano materials for catalysis and luminescence applications. From 1999 to 2003, he was Manager of Materials Development and Vice President at T/J technologies where he built and led a multi-million dollar battery research program. From 1994 to 1999, he worked at IMRA America as a Researcher on electrochemical capacitors and high power lithium ion batteries. Dr. Wang received a Bachelor's and a Master's degree in Metallurgy from Beijing University of Science and Technology in China, and a Master's and a PhD degree in Materials Science from University of Michigan in US. He is a Guest Professor at University of Electronic Science and Technology in China and an Adjunct Associate Professor at University of Michigan in USA.

Legal Proceedings

Beginning in 2014, POSCO, one of our licensees and a shareholder, has had a contractual obligation to pay us a minimum fee of \$100,000 per year to license certain technologies. This obligation is due annually on February 28 commencing in 2015. We record this license revenue at a rate of \$25,000 per quarter. POSCO is disputing that they are obligated to pay the royalties. A petition for arbitration has been filed for this matter by the Company on March 9, 2016. On July 7, 2016, we received a letter from the International Court of Arbitration and they have assigned an arbitrator to the case. No assessment or decision has made by the arbitrator as of December 31, 2016. Except as set forth above, to our knowledge, neither we nor any of our officers or directors is a party to any material legal proceeding or litigation and such persons know of no material legal proceeding or contemplated or threatened litigation. There are no judgments against us or our officers or directors. None of our officers or directors, promoters or control persons has been convicted of a felony or misdemeanor relating to securities or performance in corporate office.

Corporate Governance

Audit Committee

Our Board has established an Audit Committee, which is composed of Steven C. Jones, Arnold A. Allemang and Michael Pachos. Pursuant to our Audit Committee charter, the Audit Committee was established for the primary purpose of assisting the Board in its oversight of the Company's tax, legal regulatory and ethical compliance. The Audit Committee assists the Board in certain areas, including, but not limited to:

- Oversight and monitoring of the Company's financial statements, accounting and financial reporting processes, financial statement audits, and other financial information provided by the Company to its shareholders and others;
- Overseeing the Company's compliance with legal, regulatory, and public disclosure requirements;
- Oversight of the Company's registered public accounting firm's ("independent auditor") qualifications and independence;
- Overseeing the performance of the Company's independent auditor and the internal audit function;
- Overseeing the Company's systems of disclosure controls and procedures, internal controls over financial reporting, and compliance with ethical standards adopted by the Company;
- Oversight of treasury and finance matters;
- Oversight and monitoring of enterprise risk management, privacy, and data security;
- Oversight of the auditing, accounting, and financial reporting process generally;
- Preparation of a report of the Committee to be included in the Company's annual proxy statement in accordance with any applicable rules of the SEC; and
- Review and approval of related-party transactions (as defined by any applicable rules of the SEC and any applicable listing standards of the NASDAQ).

The members of the Committee are appointed by the Board at its annual meeting from among the Company's directors. Members are appointed to serve until their successors are duly elected and qualified by the Board, or until their resignation or removal. The Board determines the number of members on the Committee from time to time, but in any event the Committee is to be composed of at least three Board members or any greater minimum number as required by applicable law, the Company's Bylaws, or the Company's contractual obligations. The Board may appoint a chairperson and secretary for the Committee. If the Board does not appoint a chairperson or a secretary, the members of the Committee may elect a chairperson or secretary, respectively, by majority vote.

Each member of the Committee is and must be "independent" in accordance with the Company's contractual obligations and any applicable SEC and NASDAQ rules. The Board determines the standards that are currently applicable to determining whether a member is "independent" and whether each member or nominee member of the Committee satisfies those standards.

The members of the Committee must also satisfy other applicable qualification rules of NASDAQ and the SEC. Generally, each member of the Committee must have a strong level of accounting or financial acumen and must be able to read and understand fundamental financial statements. A member of the Committee may not have participated in the preparation of financial statements of the Company or any current subsidiary of it at any time during the past three years. To the extent required by applicable rules of the SEC, at least one member of the Committee must be a "financial expert" as defined by the applicable rules of the SEC. In general, to be considered a "financial expert," an audit committee member must have the following attributes:

- An understanding of generally accepted accounting principles and financial statements.
- The ability to assess the general application of generally accepted accounting principles in connection with the accounting for estimates, accruals, and reserves.
- Experience preparing, auditing, analyzing, or evaluating financial statements that present a breadth and level of complexity of accounting issues that are generally comparable to the breadth and complexity of issues that can reasonably be expected to be raised by the Company's financial statements, or experience actively supervising one or more persons engaged in such activities.
- An understanding of internal controls and procedures for financial reporting.

- An understanding of audit committee functions.

Steven Jones and Michael Pachos qualify as “audit committee financial experts” as the term is defined under the SEC rules.

The Audit Committee has established its pre-approval policies and procedures, pursuant to which the Audit Committee approved the foregoing audit services, provided by Frazier & Deeter in 2016 and 2015. Consistent with the Audit Committee’s responsibility for engaging the Company’s independent auditors, all audit and permitted non-audit services require pre-approval by the Audit Committee. The Audit Committee approves proposed services and fee estimates for these services. The Audit Committee chairperson or his designee has been designated by the Audit Committee to approve any services arising during the year that were not pre-approved by the Audit Committee.

The Audit Committee assists the Board in its general oversight of our financial reporting, internal controls, and audit functions, and is directly responsible for the appointment, compensation and oversight of the work of our independent registered public accounting firm. The Audit Committee reviews and discusses with management and our independent accountants the annual audited and quarterly financial statements (including the disclosures under "Management's Discussion and Analysis of Financial Condition and Results of Operations"), reviews the integrity of the financial reporting processes, both internal and external, reviews the qualifications, performance and independence of our independent accountants, and prepares the Audit Committee Report included in this Annual Report on Form 10-K in accordance with rules and regulations of the Securities and Exchange Commission. The Audit Committee has the power to investigate any matter brought to its attention within the scope of its duties. It also has the authority to retain counsel and advisors to fulfill its responsibilities and duties.

Nominating and Corporate Governance Committee

Our Board has established and adopted a charter for a Nominating and Corporate Governance Committee. The Committee is composed of Arnold A. Allemang, Steven C. Jones and Ravi Shanker. As provided in its charter, the Nomination and Corporate Governance Committee was established for the primary purposes of considering and reporting to the Board on matters relating to the identification, selection, and qualification of Board members and candidates nominated to the Board, and assisting the Board with respect to corporate governance matters. The Committee is responsible for providing support to the Board in certain areas, including:

- Assisting the Board by identifying individuals qualified to become Board members.
- Recommending to the Board the director nominees for the next annual meeting of shareholders.
- Leading the Board in an annual review of the Board’s performance.
- Recommending to the Board director nominees for each committee.
- Developing, maintaining, and overseeing the Company’s corporate governance guidelines.
- Making recommendations to the Board with respect to corporate governance matters.

The members of the Committee are appointed by the Board at its annual meeting from among the Company directors. The members of the Committee are appointed to serve until their successors are duly elected and qualified by the Board, or until their resignation or removal. The Board determines the number of members on the Committee from time to time, but in any event the Committee must be composed of at least three Board members or any greater minimum number as required by applicable law, the Company’s Bylaws, or the Company’s contractual obligations. The Board may appoint a chairperson and secretary for the Committee. If the Board does not appoint a chairperson or a secretary, the members of the Committee may elect a chairperson or secretary, respectively, by majority vote.

Each member of the Committee is and must be “independent” in accordance with the Company’s contractual obligations and any applicable SEC and NASDAQ rules. The Board determines the standards that are currently applicable to determining whether a member is “independent” and whether each member or nominee member of the Committee satisfies those standards.

Compensation Committee

Our Board has established a Compensation Committee, which is composed of Arnold A. Allemang, Ravi Shanker and Steven C. Jones. The Committee was established for the primary purpose of assisting the Board with the review and determination of executive compensation and the oversight, review, and approval of significant employee benefits programs, policies, and plans. The Board has adopted a Compensation Committee charter.

The members of the Committee are appointed by the Board at its annual meeting from among the Company's directors. The members of the Committee are appointed to serve until their successors are duly elected and qualified by the Board, or until their resignation or removal. The Board will determine the number of members on the Committee from time to time, but in any event the Committee must be composed of at least three Board members or any greater minimum number as required by applicable law, the Company's Bylaws, or the Company's contractual obligations. The Board may appoint a chairperson and secretary for the Committee. If the Board does not appoint a chairperson or a secretary, the members of the Committee may elect a chairperson or secretary, respectively, by majority vote.

Each member of the Committee must be "independent" in accordance with the Company's contractual obligations and any applicable SEC and NASDAQ rules. Each member of the Committee must also qualify as an "outside director" for purposes of 162(m) of the Internal Revenue Code of 1986, as amended. The Board shall determine the standards that are currently applicable to determining whether a member is "independent" and whether each member or nominee member of the Committee satisfies those standards.

Executive Committee

Our Board has established an Executive Committee, which is composed of Arnold A. Allemang, Steven C. Jones and Dr. Ravi Shanker. Pursuant to our Executive Committee charter, the Executive Committee was established for the primary purpose of exercising the powers and duties of the Board between Board Meetings and while the Board is not in session and to implement policy decisions of the Board.

During the intervals between meetings of the Board, the Committee may exercise all of the powers and authority of the Board of Directors for the purpose of acting upon matters that should not be postponed until the next scheduled meeting of the Board. The members of the Executive Committee are to exercise their business judgment to act in what they reasonably believe to be in the best interests of the Corporation and its shareholders. The Committee will have all powers and authority of the Board enumerated in the Bylaws of the Corporation, except to:

1. Take action specifically reserved for another committee of the Board;
2. Amend the Corporation's Articles of Incorporation or Bylaws;
3. Adopt an agreement of merger, conversion, or share exchange;
4. Recommend to shareholders the sale, lease, or exchange of all or substantially all of the Corporation's property and assets;
5. Recommend to shareholders a dissolution of the Corporation or a revocation of a dissolution;
6. Fill vacancies in the Board;
7. Declare a distribution or dividend or to authorize the issuance of shares; or
8. Take action with respect to any other matter that the Board may not delegate to the Committee under the Michigan Business Corporation Act, the Corporation's Articles of Incorporation, the Corporation's Bylaws, or the Corporation's contractual commitments.

Notwithstanding the foregoing, the Board may, by resolution or an amendment to this Charter, restrict the powers and authority of the Committee, in its sole discretion. In addition, the Committee shall comply with all directions of the Board and shall discharge all duties and responsibilities expressly delegated by the Board to the Committee.

The Committee may delegate any of its responsibilities, along with the authority to take action in relation to such responsibilities, to one or more subcommittees as the Committee may determine to be appropriate.

Conflicts of Interest

Certain potential conflicts of interest are inherent in the relationships between our officers and directors and us.

From time to time, one or more of our affiliates may form or hold an ownership interest in and/or manage other businesses both related and unrelated to the type of business that we own and operate. These persons expect to continue to form or hold ownership interests in and/or manage additional businesses which may compete with our business with respect to operations, including financing and marketing, management time and services and potential customers. These activities may give rise to conflicts between or among the interests of us and other businesses with which our affiliates are associated. Our affiliates are in no way prohibited from undertaking such activities, and neither we nor our stockholders will have any right to require participation in such other activities.

Further, because we have transacted business and intend to continue to do so with some of our officers, directors and affiliates, as well as with firms in which some of our officers, directors or affiliates have a material interest, including, without limitation, Samsung Ventures, ASC XGS, LLC, XGS II, LLC and AAOF, LP, potential conflicts may arise between the respective interests of us and these related persons or entities. We believe that such transactions will be effected on terms at least as favorable to us as those available from unrelated third-parties.

With respect to transactions involving real or apparent conflicts of interest, we have adopted policies and procedures which require that: (i) the fact of the relationship or interest giving rise to the potential conflict be disclosed or known to the directors who authorize or approve the transaction prior to such authorization or approval; and (ii) the transaction be fair and reasonable to us at the time it is authorized or approved by our directors.

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

The Board met 8 times in 2016. The Board of Directors also acted at times by unanimous written consent, as authorized by our Bylaws and the Michigan Business Corporation Act. The Audit Committee met 6 times in 2016. The Compensation Committee met 2 times in 2016. The Executive Committee was formed in 2016 and met 1 time in 2016. The Nominating and Governance Committee met 1 time in 2016.

Director Independence

We have five independent directors on our Board of Directors: Arnold A. Allemang, Ravi Shanker, Steven C. Jones, Michael Pachos and Dave Pendell. Philip L. Rose is not considered independent. Because our common stock is not currently listed on a national securities exchange, we have used the definition of "independence" of the NASDAQ Stock Market to make this determination.

NASDAQ Listing Rule 5605(a)(2) provides that an "independent director" is a person other than an officer or employee of the Company or any other individual having a relationship that, in the opinion of the Company's Board, would interfere with the exercise of independent judgment in carrying out the responsibilities of a director. The NASDAQ listing rules provide that a director cannot be considered independent if:

- the director is, or at any time during the past three years was, an employee of the Company;
- the director or a family member of the director accepted any compensation from the Company in excess of \$120,000 during any period of 12 consecutive months within the three years preceding the independence determination (subject to certain exclusions, including, among other things, compensation for board or board committee service);
- a family member of the director is, or at any time during the past three years was, an executive officer of the Company;
- the director or a family member of the director is a partner in, controlling stockholder of, or an executive officer of an entity to which the Company made, or from which the Company received, payments in the current or any of the past three fiscal years that exceed 5% of the recipient's consolidated gross revenue for that year or \$200,000, whichever is greater (subject to certain exclusions);
- the director or a family member of the director is employed as an executive officer of an entity where, at any time during the past three years, any of the executive officers of the Company served on the compensation committee of such other entity; or
- the director or a family member of the director is a current partner of the Company's outside auditor, or at any time during the past three years was a partner or employee of the Company's outside auditor, and who worked on the Company's audit.

The following is a summary of certain of the experience, qualifications, attributes and skills that led the Company's Board of Directors to conclude that such person should serve as a director or officer. This information supplements the biographical information provided above.

Philip L. Rose, Ph.D., Chief Executive Officer, President, Treasurer & Director. Dr. Rose has extensive international business management experience, having previously served as the chief executive officer, president and director of several companies based both in the United States and abroad, and significant experience in the electronic and specialty materials markets. Based on his practical leadership and industry experience, Dr. Rose provides valuable experience and knowledge.

Arnold A. Allemang, Chairman of the Board. Mr. Allemang's previous board service for several corporations and substantial managerial and operational history will prove valuable to the Board as it seeks to implement and maintain growth strategies that will enable the Company to succeed.

Steven C. Jones, Director. Mr. Jones' background in investment banking and in investing, as well as his prior experience serving as a member of several boards, enables him to provide the Board with valuable insight and expertise.

Michael Pachos, Director. Mr. Pachos has extensive experience in the investment and securities industries, as well as in implementing strategy, all of which experience will prove useful to the Board.

Dave Pendell, Director. Mr. Pendell's experience in successfully building businesses in a range of end-use markets will prove very useful to the Board.

Ravi Shanker, Director. Mr. Shanker's experience supporting and advising companies with respect to their growth and business development will enable him to assist the Board and management as they endeavor to expand the Company.

Code of Ethics

We have a Code of Ethics applicable to our principal executive, financial and accounting officers, a copy of which is referenced as Exhibit 14 to this report.

ITEM 11. EXECUTIVE COMPENSATION

Summary Compensation

The following table sets forth all compensation earned and accrued, in all capacities, during the fiscal years ended December 31, 2016 and 2015 by our named executive officers:

Name and Position	Year	Salary	Bonus	Option Expense ⁽¹⁾	Other	Total
Philip L. Rose, <i>Chief Executive Officer, Secretary, Treasurer</i>	2016	\$ 281,346	\$ 11,000	332,447	—	\$ 624,792
	2015	\$ 268,654	\$ 18,000	307,323	—	\$ 593,977
Michael R. Knox, <i>Former Principal Financial Officer Former Chief Financial Officer, Former Senior Vice President and Former Secretary</i>	2016	\$ 30,038		33,461		\$ 63,499
	2015	\$ 160,000		80,307	\$ 254,400 ⁽²⁾	\$ 494,707
Scott Murray, <i>Vice President of Operations</i>	2016	\$ 140,000	\$ 6,000	11,084	—	\$ 157,084
	2015	\$ 140,000	\$ 6,725	26,755	—	\$ 173,480
Robert Privette, <i>Vice President of Energy Markets</i>	2016	\$ 190,000	\$ 2,500	20,303	—	\$ 212,803
	2015	\$ 190,000	\$ 10,938	49,009	—	\$ 249,947
Liya Wang, <i>Vice President of Research & Development</i>	2016	\$ 200,000	\$ 6,000	25,324	—	\$ 231,324
	2015	\$ 200,000	\$ 14,800	60,603	—	\$ 275,403

(1) Option expense is calculated using the fair value of options that vested during the period. See Note 11 to our December 31, 2016 financial statements included in this report.

(2) Mr. Knox's other compensation included payment of compensation previously deferred under the Company's deferred compensation stock plan.

Outstanding Equity Awards

The Board of Directors of the Company occasionally awards stock options under the Company's 2007 Stock Option Plan. Additionally, stock warrants have been issued to certain officers of the Company in conjunction with financing agreements. The following table sets forth information regarding outstanding stock option and stock warrant awards as of December 31, 2016:

Name and Position(s)	Number of Securities Underlying Unexercised Options and Warrants that are currently Exercisable	Number of Securities Underlying Unexercised Options and Warrants that are currently Unexercisable	Exercise Price	Expiration Date
Philip L. Rose, <i>Chief Executive Officer, Secretary, Treasurer</i>	151,651	68,349	\$ 12.00	1/6/2022
Scott Murray, <i>Vice President of Operations</i>	10,000		\$ 8.00	12/1/2017
	10,000		\$ 12.00	6/1/2021
Robert Privette, <i>Vice President of Energy Markets</i>	20,000		\$ 12.00	6/1/2021
Liya Wang, <i>Vice President of Research & Development</i>	30,000		\$ 12.00	6/1/2021

Director Compensation

Each of our non-employee Directors who was not appointed as a representative of a corporate investor in XGS is entitled to receive compensation in accordance with Director Compensation plans as amended by the full Board of Directors from time to time. The following table sets forth information concerning the compensation of eligible Directors for the years ended December 31, 2016 and 2015:

Name	Period	Cash Compensation	Stock Option Expense ⁽¹⁾	Total Compensation
Arnold Allemang	2016	\$ —	\$ 11,105	\$ 11,105
	2015	\$ 7,500	\$ 14,501	\$ 22,001
Steven Jones	2016	\$ —	\$ 11,105	\$ 11,105
	2015	\$ 7,500	\$ 15,702	\$ 23,202
David Pendell	2016	\$ —	\$ —	\$ 8,500
	2015	\$ —	\$ —	\$ —
Ravi Shanker	2016	\$ —	\$ 12,534	\$ 12,534
	2015	\$ 7,500	\$ 12,534	\$ 20,034

(1) Option expense is calculated using the fair value of options that vested during the period. See Note 11 to the December 31, 2016 financial statements included in this report.

2007 Stock Option Plan

In 2007, we established an incentive stock option plan under which we may grant to key employees and Directors options to purchase our common stock at not less than fair market value as of the grant date. We initially reserved 75,000 shares of common stock to cover stock options that might be issued under the Stock Option Plan. However, in March 2016, shareholders holding a majority of the outstanding capital stock voted to increase the number shares reserved for issuance under the Stock Option Plan to 1,200,000. Each option is exercisable into one share of our common stock. The plan expires December 2017. The fair value of the options granted was estimated on the date of grant using the Black Scholes option-pricing model. As of December 31, 2016, 2015 and 2014, respectively, 369,750, 419,750 and 464,750 options were outstanding. Vesting of the option shares with the employees range from immediately to 25% per year. Rights to exercise the options vest immediately upon a change in control of XGS or termination of the employee's continuous service due to death or disability. The options expire at various dates through October 2023.

Employment Agreements and Potential Payments Upon Termination

The Company is party to two employment contracts. The following descriptions summarize the commitments in these agreements.

On December 16, 2013, the Company entered into an Employment Agreement with Philip L. Rose to serve as the Company's Chief Executive Officer commencing on January 6, 2014 and continuing indefinitely, subject to termination by the Company for cause or without cause, or resignation by Dr. Rose with or without cause. If the Company terminates Dr. Rose without cause, or if Dr. Rose resigns with cause, the Company has agreed to pay Dr. Rose's base salary for a period of six months, any permitted COBRA health insurance premiums for Dr. Rose and his family, and any pro-rata bonus amounts that are deemed to have been earned during Dr. Rose's employment period prior to termination. In the event that the Company terminates Dr. Rose with cause, or if Dr. Rose resigns without cause, the Company has no further obligations beyond the severance date. The Agreement provides that Dr. Rose will be paid an initial base salary of \$275,000 annually, with an annual Target Bonus opportunity of 30% of base salary, which may be earned up to a level of 150% of the Target Bonus under certain conditions. Additionally, Dr. Rose was awarded an option to purchase a total of 220,000 shares of common stock at \$12.00 per share and with a life of eight years from the award date. These stock options vest in-part based on time and in-part based on the achievement of certain milestones. In addition, Dr. Rose was granted a temporary commuting allowance of up to \$50,000 for the calendar years 2014 and 2015 and through August 31, 2016, and a one-time relocation allowance of up to \$25,000 for a permanent relocation prior to August 31, 2016.

On January 13, 2014, the Company entered into an Employment Agreement with Michael R. Knox, the Company's former CEO and co-founder. Under the terms of the Agreement, Mr. Knox accepted employment as Senior Vice President for a period of three years unless terminated, with the understanding that Mr. Knox would work approximately 1,500 hours per year on a schedule to be mutually-agreed with the CEO. The Agreement provides Mr. Knox with a base salary of \$160,000 annually and includes a continuation of regular employee benefits except paid time off. The Agreement is subject to termination by the Company at any time upon a 30-day notice. If such termination is without cause, the Company has agreed to continue to pay 50% of Mr. Knox's base salary for the remaining term of the Agreement. This Agreement also references and incorporates a stock option award that vests over the term of the Agreement. On January 31, 2016, Mr. Knox informed the Company of his resignation, which was effective February 24, 2016. Mr. Knox also resigned from the Board of Directors effective as of February 24, 2016.

ITEM 12. SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

As of March 14, 2017 (the "Ownership Date"), the following table sets forth certain information with respect to the beneficial ownership of our common stock, Series A Preferred Stock and Series B Preferred Stock by (i) by each of our directors and executive officers, (ii) by all of our director and executive officers as a group, and (iii) by each person or entity known by us to beneficially own more than 5% of any class of our outstanding shares. We have determined the number and percentage of shares beneficially owned by such person in accordance with Rule 13d-3 under the Exchange Act.

Name and Address of Beneficial Owner ⁽¹⁾⁽²⁾	Shares of Common Stock Beneficially Owned ⁽³⁾	Percentage of Shares of Common Stock Beneficially Owned ⁽⁴⁾	Shares of Common Stock Underlying Shares of Series A Preferred Stock Beneficially Owned ⁽⁵⁾	Percentage of Shares of Common Stock Underlying Shares of Series A Preferred Stock Beneficially Owned ⁽⁶⁾	Total Percentage of Outstanding Shares of Fully Converted Voting Common Stock Beneficially Owned ⁽⁷⁾
Directors, Executive Officers, and Significant Employees					
Philip L. Rose ⁽⁸⁾	187,230	8.8%	—	—	3.4%
Arnold A. Allemang ⁽⁹⁾	188,781	9.6%	—	—	3.5%
Steven C. Jones ⁽¹⁰⁾	160,406	8.1%	—	—	2.9%
David G. Pendell ⁽¹¹⁾	32,204	1.7%	5,919	*	*
Ravi Shanker ⁽¹²⁾	11,850	*	—	—	*
Michael Pachos ⁽¹³⁾	—	—	—	—	—
Scott Murray ⁽¹⁴⁾	20,100	1.0%	—	—	*
Robert Privette ⁽¹⁵⁾	20,000	1.0%	—	—	*
Liya Wang ⁽¹⁶⁾	30,000	1.5%	—	—	*
Directors & Executive Officers as a Group (9 persons)	648,221	28.4%	5,919	*	11.3%
Certain Other Beneficial Owners – Over 5% Ownership					
Aspen Advanced Opportunity Fund, LP ⁽¹⁷⁾	3,537,714	64.6%	3,537,714	70.7%	51.0%
POSCO ⁽¹⁸⁾	481,250	21.7%	281,250	8.0%	8.8%
ASC-XGS, LLC ⁽¹⁹⁾	311,293	13.8%	311,293	9.0%	5.8%
XGS II, LLC ⁽²⁰⁾	360,946	15.7%	360,946	10.0%	6.5%
SVIC No. 15 New Technology Business Investment LLP (Samsung) ⁽²¹⁾	590,079	23.4%	590,079	17.1%	11.0%
Michael R. Knox ⁽²²⁾	273,470	13.1%	135,423	3.9%	5.1%

* Less than 1%

- (1) Beneficial ownership is determined in accordance with the rules of the SEC and generally includes voting or investment power with respect to securities. In accordance with SEC rules, shares of stock issuable upon the exercise of options, warrants and other convertible securities which are currently exercisable and convertible or which become exercisable or convertible within sixty (60) days following the date of the information in this table are deemed to be beneficially owned by, and outstanding with respect to, the holder of such option, warrant or other convertible security. Subject to community property laws where applicable, and unless otherwise specified, to our knowledge, each person listed is believed to have sole voting and investment power with respect to all shares owned by such person.
- (2) Unless otherwise specified, the address of the beneficial owner shall be the business address of the Company, c/o XG Sciences, Inc., 3101 Grand Oak Drive, Lansing, MI 48911.
- (3) Number of shares of common stock includes, as of the Ownership Date: (i) shares of common stock registered in the name of the respective stockholder; (ii) shares of common stock which are issuable upon the conversion of Series A Preferred Stock registered in the name of the respective stockholder that are immediately convertible at the current Series A Conversion Rate; (iii) shares of common stock underlying common stock options and/or common stock warrants of the respective stockholder and which are exercisable within sixty (60) days of the Ownership Date; and (iv) shares of common stock which are issuable upon the exercise of warrants to purchase Series A Preferred Stock currently exercisable within sixty (60) days of the Ownership Date that are registered in the name of the respective stockholder and the conversion of such Series A Preferred Stock into common stock at the current Series A Conversion Rate.
- (4) Applicable percentage of ownership of common stock for each respective stockholder is based on 1,936,525 shares of common stock issued and outstanding as of the Ownership Date, together with: (i) shares of common stock which are issuable upon the conversion of Series A Preferred Stock registered in the name of the respective stockholder that are immediately convertible at the current Series A Conversion Rate; (ii) shares of common stock underlying stock options and/or common stock warrants registered in the name of the respective stockholder and which are exercisable within sixty (60) days of the Ownership Date; and (iii) shares of common stock underlying warrants to purchase Series A Preferred Stock registered in the name of the respective stockholder which are exercisable and convertible into common stock, at the current Series A Conversion Rate, within sixty (60) days of the Ownership Date.
- (5) Number of shares of Series A Preferred Stock includes, as of the Ownership Date: (i) shares of common stock which are issuable upon the conversion of Series A Preferred Stock registered in the name of the respective stockholder that are immediately convertible at the current Series A Conversion Rate; and (ii) shares of common stock which are issuable upon the exercise of warrants to purchase Series A Preferred Stock currently exercisable within sixty (60) days of the Ownership Date that are registered in the name of the respective stockholder and the conversion of such Series A Preferred Stock into common stock at the current Series A Conversion Rate.
- (6) Applicable percentage of ownership of Series A Preferred Stock, as of the Ownership Date, is based on 3,429,849 shares of common stock which are issuable upon conversion of all 1,829,256 shares of Series A Preferred Stock that are immediately convertible, together with shares of common stock underlying warrants to purchase Series A Preferred Stock registered in the name of the respective stockholder which are exercisable and convertible into common stock, at the current Series A Conversion Rate, within sixty (60) days of the Ownership Date.
- (7) Applicable percentage of ownership of fully converted voting common stock, as of the Ownership Date, is based on: (i) 1,936,525 shares of common stock issued and outstanding, (ii) 3,429,849 shares of common stock which are issuable upon the conversion of 1,829,256 shares of Series A Preferred Stock that are immediately convertible, (iii) shares of common stock underlying options and/or common stock warrants of the respective stockholder which are exercisable within sixty (60) days of the Ownership Date, and (iv) shares of common stock which are issuable upon the exercise of warrants to purchase Series A Preferred Stock currently exercisable within sixty (60) days of the Ownership Date that are registered in the name of the respective stockholder and the conversion of such Series A Preferred Stock into common stock at the current Series A Conversion Rate.
- (8) Philip Rose figures include: (i) 6,250 shares of common stock; (ii) 178,324 shares of common stock underlying currently exercisable options; and (iii) 2,656 shares of common stock underlying currently exercisable warrants.
- (9) Arnold Allemang figures include: (i) 151,875 shares of common stock; (ii) 24,656 shares of common stock underlying currently exercisable warrants; and (iv) 12,250 shares of common stock underlying currently exercisable options. The shares of common stock and warrants are held in the name of the Arnold Avery Allemang Revocable Trust.
- (10) Steven Jones figures include: (i) 25,000 shares of common stock; (ii) 11,000 shares of common stock underlying currently exercisable options; (iii) 46,250 shares of common stock and 9,969 shares of common stock underlying currently exercisable warrants, held in the name Jones Network, LP, of which Mr. Jones is the General Partner; (iv) 6,250 shares of common stock and 2,656 shares of common stock underlying currently exercisable warrants, held in the name Jones Extended Family Trust, of which Mr. Jones is trustee; (v) 13,000 shares of common stock and 3,750 shares of common stock underlying currently exercisable warrants, held in the name of MadSavAsh Investments, LLC, of which Mr. Jones is managing member; (vi) 21,250 shares of common stock and 4,531 shares of common stock underlying currently exercisable warrants, held in the name Steven & Carisa Jones 401K Plan and Trust, of which Mr. Jones is trustee; and (vii) 13,000 shares of common stock and 3,750 shares of common stock underlying currently exercisable warrants, held in the name of the Steven and Carisa Jones Defined Benefit Pension Plan, of which Mr. Jones is a Trustee. Mr. Jones is an affiliate of Aspen Advanced Opportunity Fund, LP (“AAOF”), which owns 1,046,308 shares of Series A Preferred Stock which are currently convertible into 1,961,827 shares of common stock and currently exercisable warrants to purchase 833,333 shares of Series A Preferred Stock which are currently convertible into 1,562,499 shares of common Stock. Mr. Jones disclaims beneficial ownership of the shares and warrants owned by AAOF.

- (11) David Pendell figures include: (i) 2,875 shares of common stock underlying currently exercisable warrants; (ii) 5,919 shares of common stock issuable upon the conversion of 3,157 shares of Series A Preferred Stock held jointly with his wife Vicky Pendell; (iii) 6,250 shares of common stock and 2,656 shares of common stock underlying currently exercisable warrants, held in the name David Pendell Revocable Trust; (iv) 6,504 shares of common stock held in the name of the Shirley G. Pendell Irrevocable Trust, of which Mr. Pendell is a trustee; and (v) 2,000 shares of common stock held in the name of Pendell Irrevocable Trust U/A dated 12/9/98, of which Mrs. Vicky Pendell is a trustee. Mr. Pendell is an affiliate of AAOF, which owns 1,046,308 shares of Series A Preferred Stock which are currently convertible into 1,961,827 shares of common stock and currently exercisable warrants to purchase 833,333 shares of Series A Preferred Stock which are currently convertible into 1,562,499 shares of common Stock. Mr. Pendell is also an affiliate of XGS II, LLC, which owns 109,172 shares of Series A Preferred Stock which are currently convertible into 204,697 shares of common stock and currently exercisable warrants to purchase 83,333 shares of Series A Preferred Stock which are currently convertible into 156,249 shares of common Stock. Mr. Pendell is also an affiliate of ASC XGS, LLC, which owns 166,023 shares of Series A Preferred Stock which are currently convertible into 311,293 shares of common stock. Mr. Pendell disclaims beneficial ownership of any shares and warrants owned by AAOF, XGS II or ASC XGS.
- (12) Ravi Shanker figures include: (i) 2,000 shares of common stock; (ii) 9,000 shares of common stock underlying currently exercisable options; and (iii) 850 shares of common shares of common stock underlying currently exercisable warrants.
- (13) Mr. Pachos was appointed to the Board by Samsung and disclaims beneficial ownership of any shares owned by SVIC No. 15 New Technology Business Investment LLP, an investment vehicle owned by Samsung.
- (14) Scott Murray figures include (i) 100 shares of common stock; and (ii) 20,000 shares of common stock underlying currently exercisable options.
- (15) Robert Privette figures include 20,000 shares of common stock underlying currently exercisable options.
- (16) Liya Wang figures include 30,000 shares of common stock underlying currently exercisable options.
- (17) Aspen Advanced Opportunity Fund, LP figures include: (i) 1,961,827 shares of common stock underlying 1,046,308 shares of immediately convertible Series A Preferred Stock, and (ii) 1,562,499 shares of common stock issuable upon the exercise and conversion of currently exercisable warrants to purchase 833,333 shares of Series A Preferred Stock.
- (18) POSCO figures include: (i) 200,000 shares of common stock, (ii) 187,500 shares of common stock underlying 100,000 shares of immediately convertible Series A Preferred Stock, and (iii) 93,750 shares of common stock issuable upon the exercise and conversion of currently exercisable warrants to purchase 50,000 shares of Series A Preferred Stock.
- (19) ASC XGS, LLC figures include 311,293 shares of common stock underlying 166,023 shares of immediately convertible Series A Preferred Stock.
- (20) XGS II, LLC figures include: (i) 204,697 shares of common stock underlying 109,172 shares of immediately convertible Series A Preferred Stock, and (ii) 156,249 shares of common stock issuable upon the exercise and conversion of currently exercisable warrants to purchase 83,333 shares of Series A Preferred Stock.
- (21) SVIC No. 15 New Technology Business Investment LLP, an investment vehicle owned by Samsung Group, figures include 590,881 shares of common stock underlying 314,709 shares of immediately convertible Series A Preferred Stock.
- (22) Michal Knox figures include: (i) 121,667 shares of common stock; (ii) 11,000 shares of common stock underlying currently exercisable warrants; (iii) 135,423 shares of common stock underlying 72,226 shares of immediately convertible shares of Series A Preferred Stock; and (iii) 5,380 shares of common stock issued in the name of his wife, Linnea Van Dyne. Mr. Knox retired from the Company and resigned as a Director on February 24, 2016.

Change in Control Arrangements

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

ITEM 13. CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

Related Party Transactions

On March 9, 2016, we issued a promissory note and warrants to purchase 2,000 shares of common stock to Mr. Arnold Allemang, our Chairman of the Board. The note matured on December 31, 2016 and the warrants have a five year term and a strike price of \$10.00. Mr. Allemang purchased the note and warrants for \$100,000. The note was paid off in full as of June 30, 2016. Mr. Allemang reinvested the proceeds from the repayment of this note plus additional other funds into our IPO.

On March 25, 2016, we issued a promissory note and warrants to purchase 2,000 shares of common stock to Mr. Steven Jones, a member of our Board of Directors. The note matured on December 31, 2016 and the warrants have a five year term and a strike price of \$10.00. Mr. Jones purchased the note and warrants for \$100,000. The note was paid off in full as of June 30, 2016. Mr. Jones reinvested the proceeds from the repayment of this note plus additional other funds into our IPO.

On March 25, 2016, we issued a promissory note and warrants to purchase 1,000 shares of common stock to Mr. David Pendell, a member of our Board of Directors. The note matured on December 31, 2016 and the warrants have a five year term and a strike price of \$10.00. Mr. Pendell purchased the note and warrants for \$50,000. The note was paid off in full as of December 31, 2016. Mr. Pendell re-invested \$48,000 of these loan repayment proceeds into our IPO.

During the period from June - December 2016, Messrs. Allemang, Jones and Pendell and certain of their affiliates invested the following amounts into our IPO and purchased the number of shares indicated.

	<u>Purchase Dates</u>	<u>Amount Invested</u>	<u>Shares Purchased</u>
Arnold Allemang and affiliates	June 23 – 28 and Sept. 30	\$ 965,000	120,625
Steven C. Jones and affiliates	June 24 – 27	\$ 748,000	93,500
David G. Pendell and affiliates	June 27 and Dec. 5	\$ 100,032	12,504
Total		\$ 1,813,032	226,629

Pursuant to the Existing Registration Statement, as of December 31, 2016, we have issued and sold (a) 120,625 shares of common stock to entities controlled by Mr. Arnold Allemang, our Chairman of the Board, (b) 93,500 shares of common stock to entities controlled by Mr. Steven Jones, our Director, and (c) 12,504 shares of common stock to entities controlled by Mr. Dave Pendell, our Director.

In conjunction with a financing with AAOF, we and our stockholders listed therein entered into a Shareholder Agreement on March 18, 2013 that contains a number of specific provisions pertaining to the Board of Directors as well as individual Directors. On February 26, 2016, we amended the Shareholder Agreement, a copy of which is referenced as Exhibit 10.6 to this report.

Among other things, the Shareholder Agreement provides for certain voting and nomination rights to be calculated on the basis of “Full Conversion” stock ownership (under which calculation, all convertible notes, preferred shares, or other convertible equity securities are deemed converted into common stock) as follows:

- So long as AAOF or its affiliates own 10% of more of the aggregate outstanding Shareholder Stock (as defined in the Shareholder Agreement):
 - the size of the Board of Directors shall be set at seven individuals.
 - one person nominated by AAOF shall be elected to the Board of Directors.
 - two members of the Board of Directors, other than those nominated by AAOF, POSCO or Hanwha Chemical, shall qualify as independent Directors.
- So long as POSCO owns 10% of more of the aggregate outstanding Shareholder Stock, one person nominated by POSCO shall be elected to the Board of Directors. POSCO does not currently own at least 10% of the aggregate outstanding Shareholder Stock and therefore, there is no POSCO representative on the Board of Directors.

- So long as Hanwha Chemical owns 10% of more of the aggregate outstanding Shareholder Stock, one person nominated by Hanwha Chemical shall be elected to the Board of Directors. Hanwha does not currently own at least 10% of the aggregate outstanding Shareholder Stock and therefore, there is no Hanwha representative on the Board of Directors.

As of December 31, 2016, the ownership percentage of AAOF, as calculated for purposes of Director voting, required the stockholders bound by the Shareholder Agreement to vote for a Director nominated by AAOF. Mr. Jones is the AAOF representative to the Board pursuant to the terms of the Shareholder Agreement.

The Shareholder Agreement grants preemptive rights to shareholders and holders of convertible notes who are parties to the Shareholder Agreement. Pursuant to the terms therein, such shareholders and noteholders have the right to purchase their pro rata share of all shareholder stock that the Company may, from time to time, propose to sell, issue, or exchange after the date of the Shareholder Agreement, other than certain excluded stock which includes stock granted to employees or as merger consideration. Each shareholder's pro rata shares shall be equal to the ratio of (i) the aggregate number of shares of the Company's common stock on a fully diluted basis, owned by the such shareholder at the time of the delivery of a preemptive rights notice to (ii) the aggregate number of shares of Company's common stock on a fully diluted basis owned by all of the Company's shareholders at the time of the delivery of a preemptive rights notice.

The Shareholder Agreement may be amended or terminated by agreement (either generally or in a particular instance and either retroactively or prospectively), only with the written consent of (i) a majority of the Company's board of directors, and (ii) persons holding, in the aggregate, shares of Shareholder Stock representing at least sixty percent (60%) of the voting power of all shares of Shareholder Stock then held by the parties thereto and their permitted assignees.

On February 26, 2016, the Shareholder Agreement was amended to provide that holders of Excluded Stock are not subject to the terms of the Shareholder Agreement. Excluded Stock means shares of common stock that are subject to a registration statement that has been filed with the SEC and has been declared effective, and, for the avoidance of any doubt, includes the 3,000,000 shares being offered under the IPO Registration Statement. This amendment took effect upon the effectiveness of our IPO Registration Statement.

The Amendment to the Shareholder Agreement further clarifies that preemptive rights shall not apply to Excluded Stock (including, without limitation, the 3,000,000 shares being offered under the IPO Registration Statement), and amends the termination date of the Shareholder Agreement. Specifically, the Shareholder Agreement has been amended to provide that it continues in effect until (i) the date of the closing of a public offering of common stock pursuant to a registration statement filed with the SEC that is declared effective in which the Company receives gross proceeds of at least \$10,000,000, on which date it shall terminate in its entirety, unless the Shareholder Agreement is earlier terminated in accordance with its terms, or (ii) the date on which the Company's common stock is listed on the NASDAQ Stock Market of the New York Stock Exchange.

Shareholder Side Letter

On January 15, 2014, AAOF, POSCO, SVIC, XGS II, Mike Knox and the Company entered into a letter agreement pursuant to which AAOF agreed to consent to, approve or otherwise sanction certain actions of the Company specified in the Shareholder Agreement so long as investors owning at least 66% of the voting securities on a fully diluted basis consent to the proposed Company action. These actions include if the Company (i) creates, obligates itself to create, authorizes or issues (by reclassification or otherwise) any new class or classes of securities which has a preference over or being on a parity with the Series A Preferred Stock in any respect; (ii) sells any material portion of the tangible or intangible assets of the Company that secures the indebtedness to AAOF; or (iii) incurs additional secured indebtedness.

Voting Agreement

In conjunction with a financing from Samsung Ventures on January 15, 2014, the Company and certain of its stockholders entered into a voting agreement with Samsung Ventures whereby for so long as Samsung Ventures owns 10% or more of the aggregate outstanding common stock of the Company (assuming Full Conversion, but excluding any shares of common stock issuable upon the exercise of any warrants held by Samsung Ventures), each stockholder made a party thereto shall vote all of his, her or its voting securities from time to time in whatever manner is necessary to ensure that at each annual or special meeting of the stockholders at which an election of Directors is held or pursuant to any written consent of the stockholders, one person nominated by Samsung Ventures is elected to the Company's Board as a Director.

The rights granted to Samsung Ventures under a voting agreement are effective until the first to occur of (1) the date on which the Minimum Ownership Requirement is no longer satisfied, (2) the date on which the Shareholder Agreement (which is described above) is terminated for any reason and (3) the date that Samsung Ventures agrees in writing to terminate the Agreement.

ITEM 14. PRINCIPAL ACCOUNTING FEES AND SERVICES

The following table sets forth the aggregate fees billed to us for fiscal years ended December 31, 2016 and 2015 by our current accountants, Frazier & Deeter, LLC (in thousands):

	<u>2016</u>	<u>2015</u>
Audit fees (1)	\$ 99	\$ 101
Non-Audit fees:	-	-
Audit related fees (2)	18	-
Tax fees	-	-
All other fees	-	-
Total fees billed	<u>\$ 117</u>	<u>\$ 101</u>

- (1) Audit fees consist of fees billed for professional services rendered for the audit of the Company's annual consolidated financial statements and reviews of its interim consolidated financial statements included in quarterly reports and other services related to statutory and regulatory filings or engagements.
- (2) Audit related fees consist of fees billed for assurance and related services that are reasonably related to the performance of the audit or reviews of the Company's consolidated financial statements and are not reported under "Audit Fees".

PART IV

ITEM 15. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

EXHIBIT NUMBER	DESCRIPTION	LOCATION
3.1	First Amendment to the Amended and Restated Certificate of Designations of Series A Convertible Preferred Stock, dated November 20, 2013	Incorporated by reference to the Company's Form S-1 filed with the SEC on January 26, 2016
3.2	Second Restated Bylaws dated March 3, 2017	Incorporated by reference to the Company's Form S-1 filed with the SEC on January 26, 2016
3.3	Certificate of Designations of Series B Convertible Preferred Stock, effective September 9, 2015	Incorporated by reference to the Company's Form S-1 filed with the SEC on January 26, 2016
3.4	First Amended and Restated Certificate of Designations of Series B Convertible Preferred Stock, effective August 18, 2016	Incorporated by reference to the Company's Form S-1, as amended, filed with the SEC on January 10, 2017
4.1	Warrant to Purchase 5,000 Shares of Common Stock, dated October 8, 2012, issued by XG Sciences, Inc. to Michael R. Knox, together with Notice and Certificate of Adjustment to Warrant, dated August 21, 2013	Incorporated by reference to the Company's Form S-1 filed with the SEC on January 26, 2016
4.2	Warrant to Purchase 833,333 Shares of Series A Convertible Preferred Stock, dated January 15, 2014, issued by XG Sciences, Inc. to Aspen Advanced Opportunity Fund, LP	Incorporated by reference to the Company's Form S-1 filed with the SEC on January 26, 2016
4.3	Warrant to Purchase 83,333 Shares of Series A Convertible Preferred Stock, dated January 15, 2014, issued by XG Sciences, Inc. to XGS II, LLC	Incorporated by reference to the Company's Form S-1 filed with the SEC on January 26, 2016
4.4	Warrant to Purchase 100,000 Shares of Series A Convertible Preferred Stock, dated January 15, 2014, issued by XG Sciences, Inc. to SVIC No. 15 New Technology Business Investment L.L.P.	Incorporated by reference to the Company's Form S-1 filed with the SEC on January 26, 2016
10.1	Form of Warrant for Series B Unit Offering	Incorporated by reference to the Company's Form S-1 filed with the SEC on January 26, 2016
10.2	Form of December Note for December Placement	Incorporated by reference to the Company's Form S-1 filed with the SEC on January 26, 2016
10.3	Form of December Warrant for December Placement	Incorporated by reference to the Company's Form S-1 filed with the SEC on January 26, 2016
10.4	Form of Subscription Agreement for December Placement	Incorporated by reference to the Company's Form S-1 filed with the SEC on January 26, 2016
10.5	Form of Subscription Agreement for Primary Offering	Incorporated by reference to the Company's Form S-1, as amended, filed with the SEC on April 5, 2016
10.6	First Amendment to Shareholder Agreement, dated February 26, 2016	Incorporated by reference to the Company's Form S-1, as amended, filed with the SEC on March 1, 2016

10.7	Draw Loan Note and Agreement, dated as of December 7, 2016, by and between the Company and Dow	Incorporated by reference to the Company's current report on Form 8-K filed with the SEC on December 9, 2016
14	Code of Ethics	Incorporated by reference to the Company's Form S-1 filed with the SEC on January 26, 2016
21	Subsidiary	Incorporated by reference to the Company's Form S-1, as amended, filed with the SEC on March 1, 2016
31.1	<u>Certifications of the Chief Executive Officer and Principal Financial Officer pursuant to Section 302 of the Sarbanes-Oxley Act of 2002</u>	Filed herewith
32.1	<u>Certification Pursuant To 18 U.S.C. Section 1350, As Adopted Pursuant To Section 906 of the Sarbanes-Oxley Act Of 2002*</u>	Furnished herewith
101. INS	XBRL Instance Document	Filed herewith
101. CAL	XBRL Taxonomy Extension Calculation Link base Document	Filed herewith
101. DEF	XBRL Taxonomy Extension Definition Link base Document	Filed herewith
101. LAB	XBRL Taxonomy Label Link base Document	Filed herewith
101. PRE	XBRL Extension Presentation Link base Document	Filed herewith
101. SCH	XBRL Taxonomy Extension Scheme Document	Filed herewith

Financial Statement Schedules

None.

SIGNATURES

In accordance with Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

XG SCIENCES, INC.

Dated: March 31, 2017

By: /s/ Philip L. Rose
Name: Philip L. Rose
Title: Chief Executive Officer, President,
Treasurer, Principal Executive Officer and
Principal Financial Officer

Dated: March 31, 2017

By: /s/ Corinne Lyon
Name: Corinne Lyon
Title: Controller and Principal Accounting Officer

**CERTIFICATION OF CHIEF EXECUTIVE OFFICER
AND PRINCIPAL FINANCIAL OFFICER
PURSUANT TO RULE 13a-14(a) OF THE SECURITIES EXCHANGE ACT OF 1934,
AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002**

I, Philip L. Rose, certify that:

1. I have reviewed this Annual Report on Form 10-K of XG Sciences, Inc.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the issuer as of and for the periods presented in this report;
4. The issuer's other certifying officer(s) and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the issuer and have:
 - (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the issuer, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
 - (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
 - (c) Evaluated the effectiveness of the issuer's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures as of the end of the period covered by this report based on such evaluation; and
 - (d) Disclosed in this report any change in the issuer's internal control over financial reporting that occurred during the issuer's most recent fiscal quarter (the issuer's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the issuer's internal control over financial reporting.
5. The issuer's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the issuer's auditors and the audit committee of the issuer's board of directors (or persons performing the equivalent functions):
 - (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the issuer's ability to record, process, summarize and report financial information; and
 - (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the issuer's internal control over financial reporting.

Date: March 31, 2017

/s/ Philip L. Rose

Philip L. Rose
Chief Executive Officer, President,
Treasurer, Principal Executive Officer and
Principal Financial Officer

**CERTIFICATION OF CHIEF EXECUTIVE OFFICER
AND PRINCIPAL FINANCIAL OFFICER
PURSUANT TO 18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO SECTION 906
OF THE SARBANES-OXLEY ACT OF 2002**

I, Philip L. Rose, Principal Executive Officer and Principal Financial Officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to the best of my knowledge:

- (1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
- (2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: March 31, 2017

/s/ Philip L. Rose

Philip L. Rose
Chief Executive Officer, President,
Treasurer, Principal Executive Officer and
Principal Financial Officer
