Zacks Small-Cap Research

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BioLife Solutions Inc (BLFS-OTCQB)

BLFS: *Update To Reflect 1:14 Reverse Split*

Current Recommendation	**Outperform**
Prior Recommendation	N/A
Date of Last Change	06/29/12
Current Price (01/28/14)	$9.00
Target Price	**$17.00**

OUTLOOK

Demand for biopreservation media is estimated to grow at an annual rate of almost 20% over the next several years, largely driven by rapid growth of the emerging field of regenerative medicine (including cell therapy and tissue engineering). BioLife's strategy is to build greater visibility and awareness of the benefits of their biopreservation products compared to the "home-brews" that currently dominate the market. Meanwhile, the company's contract manufacturing business is expected to provide a source of near-term revenue and cash flow to help fund the further development and commercialization of the biopreservation media business, which is expected to provide the bulk of revenue and drive earnings for the long-term. Share price up over 600%+ since our July initiation 2012. Maintaining Outperform rating.

SUMMARY DATA

52-Week High	**$19.60**
52-Week Low	**$3.50**
One-Year Return (%)	**107.50**
Beta	**-1.80**
Average Daily Volume (sh)	**14,768**
Shares Outstanding (mil)	**5**
Market Capitalization ($mil)	**$45**
Short Interest Ratio (days)	**N/A**
Institutional Ownership (%)	**0**
Insider Ownership (%)	**37**
Annual Cash Dividend	**$0.00**
Dividend Yield (%)	**0.00**
5-Yr. Historical Growth Rates	
Sales (%)	**8.3**
Earnings Per Share (%)	**N/A**
Dividend (%)	**N/A**
P/E using TTM EPS	**N/A**
P/E using 2013 Estimate	**N/A**
P/E using 2014 Estimate	**N/A**
Zacks Rank	**N/A**

Risk Level	**High,**
Type of Stock	**N/A**
Industry	**Med Products**

ZACKS ESTIMATES

Revenue
(in '000 of $)

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2012	836 A	1097 A	1682 A	2048 A	5663 A
2013	2160 A	2330 A	2171 A	2339 E	9000 E
2014					9814 E
2015					12187 E

Earnings per Share

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2012	-$0.06 A	-$0.10 A	-$0.07 A	-$0.10 A	-$0.33 A
2013	-$0.00 A	-$0.06 A	-$0.06 A	-$0.07 E	-$0.19 E
2014					-$0.18 E
2015					-$0.11 E

Zacks Projected EPS Growth Rate - Next 5 Years % **N/A**

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WHAT'S NEW……

Republishing Report To Reflect 1 for 14 Reverse Stock Split in Our Model

On 1/29/14 BLFS announced a 1 for 14 reverse stock split. The reverse split, along with the previously announced agreement with the two debt holders of the company's promissory notes to convert the notes to equity, is being done to meet the requirements for an uplisting of the stock to NASDAQ. We have updated our share counts in our model to reflect the reverse split, which became effective today. We have made no other changes to our model or outlook. We are maintaining our Outperform rating and price target ($1.20 pre-split, $17.00 post-split).

2013 Full-Year Revenue Pre-Announcement of ~$9.0 Million, Beats Our $8.5 Million Estimate

On 1/6/2014 BioLife pre-announced full-year 2013 expected revenue of $9.0 million which is about 6% higher than our $8.5 million estimate and represents growth of 59% from the $5.7 million generated in 2012. This implies Q4 2013 revenue of approximately $2.3 million (compared to our $1.85 million estimate), growth of 14% from Q4 2012. Q4 2013 revenue will also nearly be a new quarterly record (current quarterly record is $2.33 million, set in Q2 2013). BioLife has done an impressive job of growing revenue over the last few years with revenue increasing by 33% in 2011, 105% in 2012 and 59% expected for 2013.

We updated our model on the day of this pre-announcement.

Debt Conversion Significantly Shores Up Balance Sheet, Improves Risk Profile

In an 8-K filed on 12/16/2013 BLFS disclosed agreements with the two debt holders of the company's promissory notes to convert the notes to equity. Under the agreements, the entire (approximately) $14 million of outstanding company debt and interest will be converted to common stock in connection with the next equity issuance. The notes are secured by all of the company's assets and accrue annual interest at 7% (payable at maturity). As a reminder the maturity date of the notes had been extended several times, the most recent of which was announced in June 2012 – extending the maturity date to 2016.

And while we have noted, since initiating coverage of BLFS in July 2012, that the latest maturity extension had reduced liquidity risk, the large (and growing via accruing interest and amendment concessions) outstanding debt balance has kept the risk profile of the company elevated. Conversion of the debt to equity will significantly shore up the balance sheet and materially improve the company's risk profile.

And while conversion will significantly increase the share count, the number of new shares issued through conversion will likely be only a small fraction (perhaps 10% - 15%, depending on the price/share of the next equity issuance) of what it would have been if the debt was converted just 18 months ago due to a substantial increase in the stock price over that time.

As we noted in our initiation report back in July 2012, extension of the debt maturity also provided management more time to act opportunistically, to continue to deliver improving financial and operational results and to convert the debt at a higher stock price, thereby reducing any dilution to existing shareholders. That is exactly what has happened. BLFS stock price is up from $1.12 (adjusted for the 1:14 reverse split) in early July 2012 to about $9.00 today (and recently traded as high as $19), which is reaction to the robust revenue growth, significantly improved operating income and cash flow, and operational progress over the last several quarters.

We expect the improved risk profile upon debt conversion to also be reflected in the valuation of the company. The debt conversion agreement along with a reverse stock split (between one-for-four and one-for sixteen), which was also announced in mid-December, is expected to be executed in order to meet the requirements for an uplisting of the shares to NASDAQ.

We will update our model (mostly related to interest expense and outstanding share count) following the proposed debt conversion.

KEY POINTS

- Demand for biopreservation media is estimated to grow at an annual rate of almost 20% over the next several years

- BioLife expects to benefit from the emerging field of regenerative medicine which has recently experienced rapid growth, largely as a result of recent advancements and findings using stem cells to regenerate and repair tissues and organs

- BioLife's strategy is to build greater visibility and awareness of the benefits of their biopreservation products compared to the "home-brews" that currently dominate the market. Key advantages such as CGMP (Good Manufacturing Process) serum-free and protein-free manufacturing, extended shelf-life and higher preserved-cell yields translate into lower input costs, greater stability of finished products, and reduced quality risks for customers in regenerative medicine, biobanking and drug discovery

- Revenue growth has been on a tear, with sales increasing for 13 of the last 14 consecutive quarters (inc pre-announced Q4 2013 revenue) and product sales topping $1MM for the first time in Q3 2013. Revenue grew 33% in 2011, another 105% in 2012 and, per the 2013 revenue pre-announcement, will be up 59% in 2013. Revenue growth has benefitted from a new contract manufacturing customer as well as increased product sales, the latter recently sparked in part from accelerated uptake of HypoThermosol in the field of hair restoration and regenerative medicine. BLFS achieved positive cash flow from operations in Q4 2012 and through the first nine months of 2013

- BioLife's strategy to grow their customer base includes continuing to attend and present at industry conferences, active engagement and site visits with prospective customers by BLFS' Chief Technology Officer (a recognized expert in the field of biopreservation), and a recent free-sample campaign whereby BLFS is giving away samples of HypoThermosol and CryoStor so prospective customers can test for themselves the superiority of the products compared to competitors'

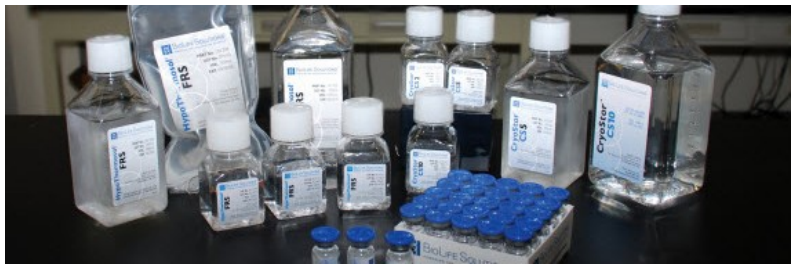
- Another key to driving awareness and early adoption has been use of both CryoStor and HypoThermosol hospital-approved and clinical trial stage products and therapies. As of November 2013 these two products are being used in about 100 hospital-approved and clinical trial stage products and therapies including several Phase II and Phase III trials

- The company is also expanding their distribution footprint and has recently entered into partnering and distribution agreements which we expect to further facilitate product sales growth

BACKGROUND

BioLife Solutions, Inc., headquartered in Bothell, Washington, has a main focus on the development and manufacture of biopreservation media products for cells, tissues and organs. Biopreservation media are solutions used to maintain the viability of biological material such as cells (including stem cells), whole blood, and tissues following removal from the body, during storage and transportation, and while undergoing handling, manipulation and processing by researchers engaged in regenerative medicine product development. Demand for biopreservation media is estimated to grow at an annual rate of almost 20% over the next several years. BioLife expects to benefit from the emerging field of regenerative medicine (including cell therapy and tissue engineering) which has recently experienced rapid growth, largely as a result of recent advancements and findings using stem cells to regenerate and repair tissues and organs, as well as to treat a number of diseases.

BioLife Solutions, Inc. biopreservation media products



The company's current suite of biopreservation media products includes HypoThermosol, CryoStor, and generic BloodStor which are marketed to regenerative medicine companies, hospital-based stem cell transplant centers, pharmaceutical companies, cord blood and adult stem cell banks, hair transplant surgeons, and suppliers of cells to the drug discovery, toxicology testing and diagnostic markets. The company also has a contract manufacturing business which provides aseptic media formulation, fill and finish services.

The contract manufacturing business, which contributed $2.6MM of revenue in 2012 (including $1.2MM in Q4) and which we expect to generate over $4 million of revenue in 2013, has benefitted from the signing of a key customer during 2011. We expect this to provide a source of near-term revenue and cash flow to help fund the further development and commercialization of the biopreservation business, which BioLife expects to provide the bulk of revenue and drive earnings for the long-term.

BioLife's strategy is to build greater visibility and awareness of the benefits of their biopreservation products compared to the "home-brews" that currently dominate the market. Key advantages such as extended shelf-life and higher preserved-cell yields translate into reduced input costs (i.e. - lower COGS) and greater stability of finished products for customers in regenerative medicine, biobanking and drug discovery. BioLife will use this as part of their marketing message as they look to grow their direct and distributor customer base which already encompasses ~500 organizations including some leading life sciences companies such as Life Technologies, Sigma-Aldrich, Cellular Dynamics and Athersys.

Revenue could potentially really ramp for the long-term if development-stage therapies using BLFS's biopreservation media gain FDA approval and are commercialized. This would offer a significantly greater upside revenue opportunity for BioLife as well as a much more stable source of revenue than as a supplier in the R&D process. BLFS recently noted that their products are now being used in about 100 hospital-approved and clinical trial stage products and therapies including several Phase II and Phase III trials. BLFS believes that they hold the number one supplier position among companies offering pre-formulated cell and tissue storage and freeze media used in clinical trial stage cellular therapies to treat the leading causes of death and disability such as cancer, heart disease, stroke, and joint/movement disorders.

BIOLOGICAL MATERIAL BIOPRESERVATION

Biological material such as cells, whole blood, tissue and organs begin degrading and losing viability immediately following removal from the donor body. For instance, stem cells extracted from the umbilical cord must be preserved immediately and effectively to retain their viability for use in regenerative medicine. Chilling (hypothermia) is often used to reduce metabolism (i.e. - chemical processes) and to help stabilize and reduce degradation of the biological material but it can also have the unintended effect of causing cellular damage and death, especially during long periods of non-frozen shipment, and the freezing and thawing process. Immediately following removal, biological material are bathed or stored in biopreservation solutions (i.e. - media) in order to maintain their viability and to protect cells from cellular and molecular damage during storage and transportation.

Biopreservation media are also used by researchers engaged in regenerative medicine product development to maintain stability of cellular material during handling, manipulation and processing.

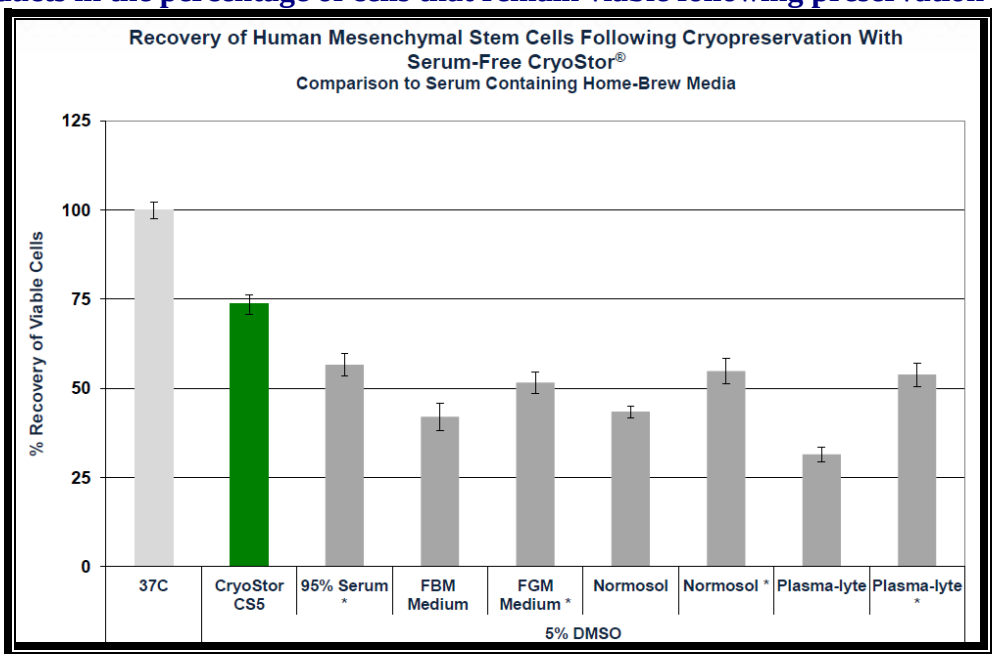
Depending on the biological material in question as well as the intended time until it will used, optimum chilling temperature could range from just above freezing (35˚F to 46˚F) to cryogenic (< -240˚F).

The majority (estimated at ~80% of the market) of **traditional biopreservation media** used today consist of "home-brews" or in-house solutions, the ingredients for which may be supplied by third parties but mixed by the end-user. BioLife Solutions believes, based on independent testing, that their products offer certain advantages over these home-brews in terms of performance, reliability, shelf-life and in the overall preservation of the viability and stability of cells. Per BioLife, the superior performance of their products is mostly a result of the use of different ingredients relative to competing products as well as optimization of concentrations of ingredients. Namely, unlike many competing solutions, BioLife's products do not contain animal serum or proteins which are facing increasing scrutiny from regulatory agencies due to the risk of xenographic disease transmission. BioLife also uses both DMSO (dimethyl sulfoxide), a common permeating cryoprotectant used for cryopreservation (i.e. - deep freeze), as well as non-permeating cryoprotectants in its cryopreservation products while most competing products use only DMSO. Furthermore, aside from the cryoprotectants, BioLife's intracellular-like media ingredients are balanced specifically to protect cells during cold preservation conditions (similar to the design of organ transplant preservation solutions), in contrast to traditional home-brew cocktails and competing commercial media that are designed as isotonic solutions designed for normal body temperatures.

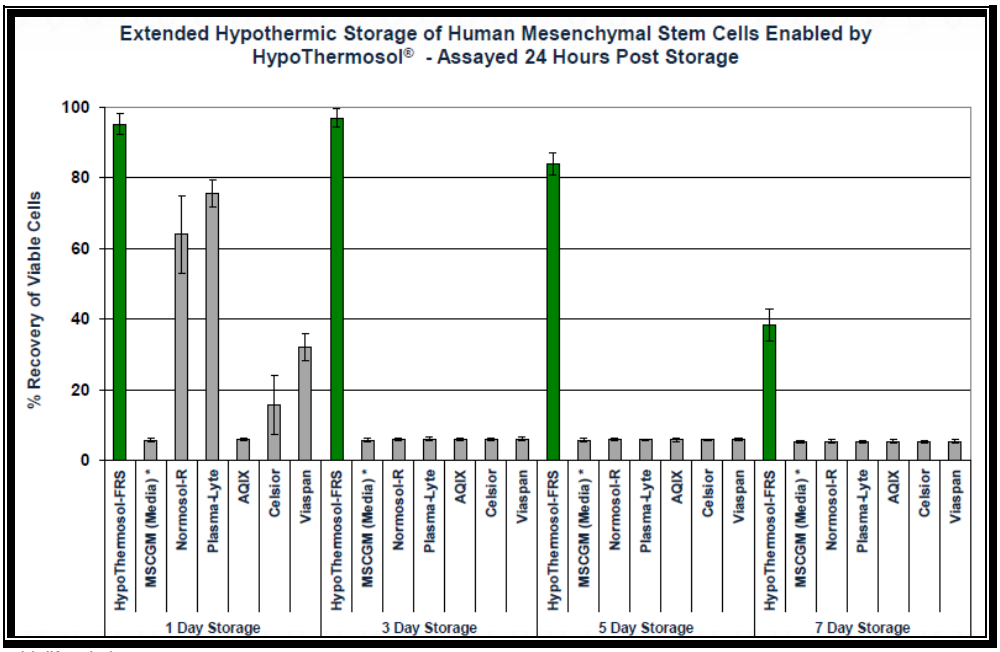
In addition and unlike home-brew solutions, BioLife's products are pre-formulated and sterile-filtered using high-grade USP (U.S. Pharmacopeia) components and manufactured under CGMP (good manufacturing practice) manufacturing standards, helping to assure product consistency and quality. By contrast, the components of home-brews are often sourced from multiple vendors, are typically not USP-grade, and must be mixed on-site, all or any of which can contribute to issues with consistency and quality. And by using CGMP-manufactured products, this facilitates BioLife's current and prospective customers with quality and regulatory approvals that may be required when using the company's products in their product development and manufacturing processes. This is a particularly key advantage as regulatory agencies (i.e. - FDA) will want to be assured that the quality and consistency of the biopreservation media used in clinical trials is similar to that used in the final approved product used for commercial production. BioLife's products offer this assurance, while almost all home-brews can not.

BioLife's over two decades of molecular research which focused on how chilling can damage cells provided the backbone for their product development as well as the differentiation and value-added of their products versus competing biopreservation media. Specifically, BioLife's research enabled them to better understand how chilling influenced cell apoptosis (programmed cell death) and necrosis (traumatic cell death) which guided their R&D strategy towards development of biopreservation media that reduced preservation-induced cell stress. This ultimately resulted in the development of a new class of biopreservation media which have shown an ability to significantly extend shelf life and stability of biological material. The initial product developed from this research was HypoThermosol which helped form the basis for product extensions including the development of CryoStor and BloodStor. The products are covered with six issued U.S. patents, one issued European patent, and one issued Japanese patent. In addition, there are several pending U.S. and international patent applications.

BioLife's studies have shown their biopreservation media outperform competing products in the percentage of cells that remain viable following preservation



* contains serum



SOURCE: biolifesolutions.com

* contains serum

Value-Added With Increased Biologic Stability….

Longer shelf-life and increased stability of preserved cells means lower input costs (from higher yields, less spoilage of source cells) and higher potency and stability of finished products for developers and manufacturers of cell therapy products. Extended shelf-life and stability equates to longer holding time which also means that the sourced cells and finished product can travel greater distances and, therefore, have a greater viable geographic footprint. The ability to have a bigger geographic footprint is becoming ever more important as drug discovery (including clinical trials), drug manufacturing and distribution, and cell input sourcing are all experiencing significant growth in overseas areas such as Europe and Asia. In fact, *Pharmaceutical Commerce*, a publication focused on the processes involved in getting new drugs to market, recently published a study on cold chain shipping related to life sciences called "Biopharma Cold Chain Sourcebook 2010." In it they note that cold-chain shipping to/from Asia and emerging markets is forecast to grow by about 50% and 33%, respectively.

BIOLIFE SOLUTIONS' PRODUCTS *(descriptions per BLFS's website and public filings)*

- **HypoThermosol** biopreservation media is a novel, engineered, optimized hypothermic storage and shipping media product. Serum-free, protein-free HypoThermosol is designed to provide maximum storage and shipping stability for biologics at 2-8°C. This proprietary, optimized formulation mitigates temperature-induced molecular cell stress responses that occur during chilling and re-warming of biologics, intermediate products, and final cell products intended for research and clinical applications. Similar to our companion freeze media CryoStor, HypoThermosol FRS includes components that scavenge free radicals, provide pH buffering, oncotic/osmotic support, energy substrates, and ionic concentrations that balance the intracellular state at low temperatures. Across a broad spectrum of cell and tissue types, HypoThermosol product has proven much more effective in reducing post-preservation necrosis and apoptosis as compared to commercial and home-brew isotonic and extracellular-like formulations. This results in greatly extended shelf life and improved post-preservation viability. HypoThermosol is tested to USP <71> Sterility and USP <85> Endotoxin testing standards, and is manufactured under CGMP.

  HypoThermosol is packaged in four convenient alternatives:

  10mL Vial

  - HypoThermosol FRS 10mL Vial: Sterile vial filled with 10mL of HypoThermosol, closed with a flip top septum for needle access. Designed for initial product sampling or single-use applications.
  - HypoThermosol FRS 100mL Bottle: Nalgene PETG square media bottle with a screw cap, designed for applications requiring a larger volume of HypoThermosol, where repeated access to the container is not expected.

  500mL IV Bag

  - HypoThermosol FRS 500mL Bottle: Nalgene PETG square media bottle. Designed for even larger volume applications such as tissue transport and storage.
  - HypoThermosol FRS 500mL IV Bag: EVA media bag with syringe and spike ports. Designed for improved aseptic technique when aliquotting HypoThermosol for multiple doses or repeated processing.

- **CryoStor** cryopreservation freeze media products have been designed to mitigate temperature induced molecular cell stress responses during freezing and thawing. CryoStor proprietary freeze media products are intended for cryopreservation of biologics at -80 to -196°C and are based on the novel HypoThermosol formula. All CryoStor products are pre-formulated with USP-grade DMSO, a permeating cryoprotective agent which helps mitigate damage from the formation of intracellular ice. Across a broad spectrum of cell types, CryoStor products have proven much more effective in reducing post-preservation necrosis and apoptosis as compared to commercial and home-brew isotonic and extracellular formulations. This enables greatly improved post-thaw cell yield, viability, and recovery. CryoStor products are tested to USP <71> Sterility and USP <85> Endotoxin testing standards, and are manufactured under CGMP. CryoStor is offered in several packages and pre-formulated with DMSO in final concentrations of 2%, 5%, and 10%.

  CS10 Freeze Media

  - CryoStor CS10 Freeze Media: Pre-formulated with 10% DMSO, CryoStor CS10 has demonstrated remarkable biopreservation efficacy in numerous cell types, including sensitive cells such as hepatocytes.
  - CryoStor CS5 Freeze Media: Pre-formulated with 5% DMSO, CryoStor CS5 routinely outperforms competing freeze media containing 10% DMSO and is applicable for cryopreservation of most cell types.
  - CryoStor CS2 Freeze Media: Pre-formulated with 2% DMSO. In some cell types, CryoStor CS2 has demonstrated biopreservation efficacy at or above the levels of competing commercial and in-house formulated freeze media, even in the presence of greatly reduced levels of DMSO.

- **BloodStor** freeze media is a generic equivalent to a standard cryopreservation media for stem cells isolated from umbilical cord blood, peripheral blood, and bone marrow. BloodStor 55-5 is pre-formulated with 55% (w/v) DMSO USP, 5% (w/v) Dextran-40 USP, and water for injection (WFI) quality water. BloodStor 100 contains 100% (w/v) DMSO USP. BloodStor products are tested to USP <71> Sterility and USP <85> Endotoxin testing standards, and are manufactured under CGMP.

BloodStor 55-5



SOURCE: biolifesolutions.com

- BloodStor 55-5 Biopreservation Media: BloodStor 55-5 contains 55% USP grade DMSO and 5% USP-grade Dextran-40 in water for injection quality water (WFI) and supports a common cord blood processing protocol. The product is packaged in industry standard, single-use sterile vials with a fill volume of 7.2mL.

- BloodStor 100 Biopreservation Media: BloodStor 100 contains 100% USP grade DMSO and is packaged in 50ml and 100mL vials.

MARKETS

BioLife currently has over 500 customers and distributors in three main market segments; regenerative medicine, biobanking, and drug discovery. By some estimates, the biopreservation media market is expected to grow from about $150 million in 2011 to $500 million by the year 2018.

Regenerative Medicine
Regenerative medicine, as defined by the National Institute of Health, is "the process of creating living, functional tissues to repair or replace tissue or organ function lost due to age, disease, damage, or congenital defects." It's focused on both regenerating damaged tissues and organs in the body as well as growing tissues and organs in the laboratory and then implanting them in the body. The field has expanded greatly to also include cellular based therapies used to treat numerous diseases and disorders.

The field of regenerative medicine is growing very rapidly, largely as a result of recent advancements and findings using stem cells to regenerate and repair tissues and organs. Stem cells are being investigated for variety of uses including diabetes, cardiac repair, bone regeneration, and brain injury repair. BioLife cites a study by MedMarket Diligence that estimates the worldwide market for regenerative medicine is growing at 20% per year. Another study, from Visiongain, also supports a robust outlook for regenerative medicine and predicts this market will grow from $1.4 billion in 2012 to $10 billion in 2020 (~28% CAGR).[1] BioLife expects to benefit from the emerging field of regenerative medicine and is positioning their HypoThermosol and CryoStor products as a better alternative to other branded biopreservation media and home-brews, the latter which are estimated to hold as much as 80% of the regenerative medicine market.

The regenerative medicine market segment is comprised of nearly 700 commercial companies and numerous other hospital-based transplant centers developing and delivering cellular therapies such as stem cells isolated from bone marrow, peripheral and umbilical cord blood as well as engineered tissue-based products. BioLife's initial focus relative to regenerative medicine is as a supplier of reagents to life sciences companies using stem cells and other biological material in research and development of novel therapies. BioLife notes that they have shipped their biopreservation media products to over 250 regenerative medicine customers and estimate that their products are now incorporated in over 50 regenerative medicine cell or tissue-based products in pre-clinical and clinical trial stages of development. BioLife believes that they hold the number one supplier position among companies offering pre-formulated cell and tissue storage and freeze media used in clinical trial stage cellular therapies to treat the leading causes of death and disability such as cancer, heart disease, stroke, and joint/movement disorders.

As a supplier in the R&D chain, BioLife's revenue can be choppy, inconsistent and highly dependent on the progress and success of their customers' research projects. However, if and when these development-stage therapies gain FDA approval, the opportunity for BioLife could be as a direct supplier of their biopreservation media to their customers' commercial product development. This would offer a significantly greater upside revenue opportunity for BioLife as well as a much more stable source of revenue than as a supplier in the R&D process. BioLife believes that annual revenue from a typical regenerative medicine customer could reach $1 million per year within three to five years following their product approval.

Biobanking
Biobanking refers to a repository that stores human biological samples for research. Over the past 20 years, biobanking of human specimens has become a central activity underpinning all aspects of biomedical research as

[1] *Translational Regenerative Medicine: Market Prospects 2012-2022.* Visiongain, August 31, 2012

well as the development of personalized medicine. Biobanking encompasses a wide range of specimen types and sample collection designs, ranging from population-based biobanking of specimens from healthy subjects in large, epidemiological cohorts to specific biobanking of diseased tissues obtained in the course of clinical interventions. Human tissue biobanking is of particular importance for implementation of novel biomarkers into clinical trials, as well as for the application of a wide range of new technologies to the discovery and validation of new, molecular patterns of disease.[2]

BioLife's biobanking customers include public and private cord blood banks, adult stem cell banks, tissue banks, hair transplant centers, and biorepositories. The company notes that since the launch in the third quarter of 2009, BloodStor continues to realize increased sales in the biobanking market. Sales of CryoStor and HypoThermosol in this segment also continue to increase as they displace home-brews. Recently, demand for HypoThermosol in the field of hair restoration (specifically for ex vivo storage of hair grafts) has accelerated and contributed to the overall increase in BLFS's product sales.



Contract Manufacturing
BioLife's contract manufacturing business provides aseptic media formulation, fill and finish services. During 2011 BioLife signed a multi-year contract manufacturing agreement with a new multinational customer. Specific terms of the contract (including the $ amount, term, or customer's name) were not released although BioLife did indicate at the time that their contract manufacturing revenue should increase significantly in 2012 as a direct result of this new agreement. The initial revenue from this contract commenced in Q2 and just as management predicted, contract manufacturing revenue jumped shortly afterwards - to $341k in Q2 (+408%), to $1.1MM in Q3 (+939%) and to $1.2MM in Q4 (+3366%). Contract manufacturing revenue was $3.3 million through the first nine months of 2013, up from just $1.4 million over the same period in 2012.

In March 2012 BioLife increased its leased space, doubling its leased footprint to over 21k sf, significantly increasing its manufacturing capacity to accommodate the new contract manufacturing deal as well as anticipated increased demand for its biopreservation products. BioLife completed the build out of this additional manufacturing space during Q2 2012.

The contract manufacturing business, while providing a source of near-term revenue and cash flow and upping utilization of fixed assets and manufacturing space, is not necessarily expected to become a fundamental part of BioLife's long-term growth strategy. It does, however, offer a source of funding for the further development and commercialization of the biopreservation products business, which BioLife expects to provide the bulk of future revenue and drive earnings for the long-term.

Drug Discovery
BioLife supplies biopreservation media to pharmaceutical companies and cell suppliers which grow and preserve various cell types which act as the "guinea pigs" for testing new drug candidates. BioLife notes that their key customers in the drug screening segment include eight of the top ten largest cell suppliers and numerous pharmaceutical companies.

FINANCIAL CONDITION / CAPITAL STRUCTURE

Cash
Q3 cash flow from operations was an outflow of $13k. Ex-changes in working capital, cash flow from operations was an outflow of $178k. BLFS exited the quarter with $79k in cash and equivalents, roughly flat from Q2. BLFS notes in the current 10-Q that, "We believe our current cash and cash provided by operations will satisfy our working capital requirements, debt obligations and capital expenditures for the foreseeable future."

Debt

[2] *The role of the pathologist in tissue banking: European Consensus Expert Group Report.* Generoso Bevilacqua, Fred Bosman, Thibaut Dassesse, Heinz Höfler, Anne Janin, Rupert Langer, Denis Larsimont, Manuel M. Morente, Peter Riegman, Peter Schirmacher, Giorgio Stanta, Kurt Zatloukal, Elodie Caboux, Pierre Hainaut Virchows Arch. 2010 April; 456(4): 449–454. Published online 2010 February 16. doi: 10.1007/s00428-010-0887-7

Debt consists of $10.6 million and $3.3 million in promissory notes and related accrued interest, respectively. The loans (2 loans for $5.25MM each) were issued to two private investors, one of which is a director of BLFS, in October 2008 with an original maturity date in January 2010. The notes are secured by all of BioLife's assets and accrue annual interest at 7% (payable at maturity).

The maturity date of the promissory notes has been extended several times, the most recent of which was announced in June 2012 - extending the maturity to January 2016. In connection with the most recent maturity extension, the amount of the loans were increased to $5.75 million ($11.5 million in aggregate). In consideration of amending the maturity date to 2016, the two investors of the loans were each issued five-year warrants to purchase 1 million shares of BLFS common stock at $0.08/share. The three-year maturity extension reduces liquidity risk.

In an 8-K filed in December 2013, BLFS disclosed an agreement with these two debt holders to convert these promissory notes (plus accrued interest) into common stock. Under the agreements, the entire (approximately) $14 million of outstanding company debt and interest will be converted to common stock in connection with the next equity issuance. Conversion of the debt to equity will significantly shore up the balance sheet and materially improve the company's risk profile, which we expect will be reflected in the valuation of the company.

Share Count
As of 12/31/2012 the basic and diluted share count outstanding stood at about 70 million (~5M pro forma for the 1:14 reverse split which was effective 1/29/14). And while conversion of the notes to equity will significantly increase the share count, the number of new shares issued through conversion will likely be only a small fraction (perhaps 10% - 15%, depending on the price/share of the next equity issuance) of what it would have been if the debt was converted just 18 months ago due to a substantial increase in the stock price over that time.

OUTLOOK

BioLife sells their biopreservation products directly to customers as well as indirectly through distributors. Approximately 80% of the $2.8 million in total revenue in 2011 came from product sales directly to customers. Contract manufacturing revenue had been immaterial but recently jumped as a result of the aforementioned contract signed in late 2011.

Q4 revenue (based on the recent pre-announcement) of $2.3 million will represent y-o-y growth of 14%. Revenue, through Q4 2013, will have increased sequentially 13 of the last 14 quarters. 2013 revenue, per management, will be $9.0 million, growth of 59% from 2012. And while contract manufacturing was the major revenue driver in 2012 as well as through the first two quarters of 2013, product sales, which came in at over $1 million (an all-time record) in Q3, are expected to be more meaningful going forward. As revenue from product sales, as opposed to contract manufacturing, is what we think will be the long-term driver of the top line as well as a major catalyst to increasing value of the company as a whole, this is a significant milestone.

Also noteworthy is that revenue in 2013 of $9.0 million will crush the full-year guidance of $6.5MM - $7.0MM that management had issued earlier in 2013.

Since the pre-announcement we now model 2013 revenue of $9.0 million, which is revised up from $8.5 million. We assume sales to the new contract manufacturing customer, which commenced in Q2 2012, help push contract manufacturing revenue to about $4.6 million in 2013. Importantly, product sales, the expected long-term driver of BLFS, have also started to pick up steam. We look for product sales to grow almost 25% in 2013. While we think it remains too early to assume BLFS will generate positive cash from operations from here on out, the last four quarters were clearly a good sign in that direction.

BioLife's strategy to grow their customer base includes building greater visibility and awareness of the benefits of their biopreservation products compared to competitors', especially the various "home-brews" that currently dominate the market. This includes continuing to attend and present at industry conferences, active engagement and site visits with prospective customers by BLFS' Chief Technology Officer (a recognized expert in the field of biopreservation), maintaining current and building new distribution relationships, and a recent free-sample campaign whereby BLFS is giving away samples of HypoThermosol and CryoStor so prospective customers can test for themselves the superiority of the products compared to competitors'. Another key to driving awareness

and early adoption has been use of both CryoStor and HypoThermosol hospital-approved and clinical trial stage products and therapies. As of November 2013 these two products are being used in about 100 hospital-approved and clinical trial stage products and therapies including several Phase II and Phase III trials. BLFS is also expanding their distribution footprint and has recently entered into partnering and distribution agreements which we expect to further facilitate product sales growth.

Our out-year (≥ 2014) revenue estimates are based on very general assumptions, including that contract manufacturing revenue can be maintained at over $4 million and biopreservation product sales are driven largely from continued increases in the customer base. If and when one or more therapies currently in clinical testing that are using BioLife's biopreservation media gain FDA approval, this could spark a significantly greater ramp in revenue. Management believes that each regenerative medicine product that reaches worldwide commercialization could be worth as much as $1 million - $2 million in revenue (three to five years after launch) to BioLife as the biopreservation media supplier. While we do not yet model any revenue contribution related to supplying an approved therapy, when there is greater visibility on the potential for that happening, we will update our model accordingly.

VALUATION / RECOMMENDATION

Our comparable group used to value BLFS consists of direct competitors as well as small stem cell therapeutics and regenerative medicine companies. Our valuation metrics include enterprise value-to-sales (EV/Sales) and price-to-sales (P/Sales) multiples using sales at trailing twelve months (ttm), estimated 2013, and estimated 2014 (estimates from analyst forecasts).

Based on these six metrics, BioLife is valued between approximately $11/share and $23/share. Average valuation of all six metrics is about $17/share. BLFS currently trades at approximately $9.00, which is below what we calculate to be fair value. We are maintaining our Outperform rating. Our price target is $17/share.

	TICKER						Implied
METRIC	STEM	LIFE	SIAL	ISCO	CYTX	Average	BLFS pps
EV/Sales (ttm)	39.0	3.9	3.8	3.1	12.0	12.4	$15.39
EV/Sales (2013 E)	19.5	0.0	3.8	5.4	11.8	8.1	$16.10
EV/Sales (2014 E)	13.2	0.0	3.6	3.2	6.0	5.2	$10.70
P/Sales (ttm)	12.8	2.1	3.4	7.7	19.0	9.0	$20.24
P/Sales (2013 E)	23.8	3.4	3.8	7.3	13.3	10.3	$23.22
P/Sales (2014 E)	13.2	0.0	3.6	3.2	6.0	5.2	$16.81
						Avg.	**$17.08**

RISK FACTORS

- Cash position is tight and despite the potential of positive operating cash flow in 2013, BioLife may need to raise additional funds in the near term

- The revenue growth in 2012 and through the first 9 months of 2013 has largely been from the contract manufacturing business which is not only lower margin, it is a much less stable and predictable source of revenue than biopreservation media products sales

- Our modeled revenue growth of biopreservation media beyond the current year is largely best-guesses at this point based on growth in the customer base. Revenue could underperform relative to our model if the customer base does not grow at our assumed forecast or is less correlated to revenue growth than what we are assuming. As contract manufacturing revenue can be unpredictable, it's very difficult to gauge whether our estimates (particularly in the out-years) will prove accurate

- Long-term viability of BLFS might require one or more therapies using BioLife's biopreservation media gaining FDA approval. While it's conceivable that this might happen over the next two years, it's also possible that it could take significantly longer or never happen at all

- Balance sheet is highly levered with ~$10.6 million in debt and $3.3 million in accrued interest outstanding. This risk is at least somewhat mitigated by the fact that it is owned by a director of BLFS who has obvious interests in amending terms of the debt when needed (as evidenced at various times in the past) and the recent agreement to convert the debt to equity at the next equity issuance

FINANCIAL MODEL

BioLife Solutions Inc.

	2012 A	Q1A	Q2A	Q3A	Q4E	2013 E	2014 E	2015 E	2016 E
Product Sales & Ctrct Manuf	$5,643.0	$1,550.8	$2,330.0	$2,170.5	$2,339.0	$8,390.3	$9,794.2	$12,167.3	$15,702.9
YOY Growth	*106.0%*	*86.6%*	*113.3%*	*29.5%*	*14.5%*	*48.7%*	*16.7%*	*24.2%*	*29.1%*
Licensing Revenue	$20.0	$609.2	$0.0	$0.0	$0.0	$609.2	$20.0	$20.0	$20.0
YOY Growth	*222.8%*	*133.2%*	*47.5%*	*-78.3%*	*-90.6%*	*2945.8%*	*-96.7%*	*0.0%*	*0.0%*
Total Revenues	$5,663.0	$2,160.0	$2,330.0	$2,170.5	$2,339.0	$8,999.5	$9,814.2	$12,187.3	$15,722.9
YOY Growth	*105.3%*	*158.4%*	*112.3%*	*29.1%*	*14.2%*	*58.9%*	*9.1%*	*24.2%*	*29.0%*
Cost of Product Sales	$3,370.6	$1,034.5	$1,501.6	$1,281.6	$1,460.2	$5,278.0	$5,576.7	$6,707.9	$8,241.9
Gross Income	$2,292.4	$1,125.5	$828.4	$888.9	$878.8	$3,721.5	$4,237.5	$5,479.4	$7,481.0
Gross Margin	*40.5%*	*52.1%*	*35.6%*	*41.0%*	*37.6%*	*41.4%*	*43.2%*	*45.0%*	*47.6%*
R&D	$463.7	$106.0	$94.9	$160.5	$155.0	$516.4	$625.0	$690.0	$730.0
% R&D	*8.2%*	*4.9%*	*4.1%*	*7.4%*	*6.6%*	*5.7%*	*6.4%*	*5.7%*	*4.6%*
Selling & Mktg	$619.2	$202.8	$214.8	$208.1	$210.0	$835.6	$902.9	$1,096.9	$1,242.1
% Sell&Mktg	*10.9%*	*9.4%*	*9.2%*	*9.6%*	*9.0%*	*9.3%*	*9.2%*	*9.0%*	*7.9%*
G&A	$2,151.8	$624.4	$601.9	$630.3	$636.0	$2,492.7	$2,698.9	$3,290.6	$4,087.9
% G&A	*38.0%*	*28.9%*	*25.8%*	*29.0%*	*27.2%*	*27.7%*	*27.5%*	*27.0%*	*26.0%*
Operating Income	($942.2)	$192.3	($83.1)	($110.1)	($122.2)	($123.1)	$10.7	$402.0	$1,420.9
Operating Margin	*-16.6%*	*8.9%*	*-3.6%*	*-5.1%*	*-5.2%*	*-1.4%*	*0.1%*	*3.3%*	*9.0%*
Total Other Inc. (Exp.)	($717.4)	($199.5)	($199.7)	($199.8)	($205.0)	($804.0)	($905.0)	($965.0)	($730.0)
Pre-Tax Income	($1,659.7)	($7.2)	($282.8)	($309.9)	($327.2)	($927.1)	($894.3)	($563.0)	$690.9
Taxes	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Tax Rate	-	-	-	-	-	-	-	-	-
Net Income	($1,659.7)	($7.2)	($282.8)	($309.9)	($327.2)	($927.1)	($894.3)	($563.0)	$690.9
YOY Growth	*-17.8%*	*-97.6%*	*-43.3%*	*-12.0%*	*-36.0%*	*-44.1%*	*-3.5%*	*-37.1%*	*-222.7%*
Net Margin	*-29.3%*	*-0.3%*	*-12.1%*	*-14.3%*	*-14.0%*	*-10.3%*	*-9.1%*	*-4.6%*	*4.4%*
EPS	($0.33)	($0.00)	($0.06)	($0.06)	($0.07)	($0.19)	($0.18)	($0.11)	$0.14
YOY Growth	*-17.8%*	*-97.6%*	*-43.6%*	*-12.5%*	*-36.5%*	*-44.4%*	*-4.8%*	*-37.1%*	*-222.7%*
Diluted Shares O/S	4,977	4,991	5,003	5,008	5,011	5,003	5,071	5,071	5,071

Brian Marckx, CFA

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MANAGEMENT

Michael Rice
Chairman & Chief Executive Officer

Mike Rice became president and chief executive officer and a member of our Board of Directors in August 2006, and Chairman in August 2007. He has more than 20 years of leadership and entrepreneurial experience in the medical and high tech industries. He was most recently the senior business development manager for medical and wireless products at AMI Semiconductor (NASDAQ:AMIS). Mr. Rice also served as the director of marketing and business development at Cardiac Science, Inc., a manufacturer of automated external defibrillators. Prior to that, he was the Vice President, Sales and Marketing for TEGRIS Corporation, a privately held network services provider. Mr. Rice also spent 12 years at Physio Control Corporation in several sales and marketing management roles prior to its acquisition by Medtronic Inc.

Aby J. Mathew, Ph.D.
Sr. Vice President and Chief Technology Officer

Dr. Mathew was part of the founding team of BioLife Solutions, and is a co-developer of BioLife′s biopreservation media solutions. He is a co-inventor on multiple issued and pending patents related to methods, devices, and formulations for the preservation of cells, tissues, and organs. He holds a Ph.D. in Biological Sciences within the Biochemistry, Cell and Molecular Biology Program from Binghamton University and a B.S. in Microbiology from Cornell University. Dr. Mathew has been researching low temperature biopreservation since 1994, and his studies contributed to the development of BioLife′s current commercial HypoThermosol and CryoStor product platforms and intellectual property foundation. Dr. Mathew was part of the scientific team that linked cell death via apoptosis (programmed cell death) to exposure to hypothermic and/or freezing temperatures. These discoveries were integral to the development of BioLife′s improved intracellular-like biopreservation solutions, and also contributed to improvements in cryosurgical ablation of cancer. Dr. Mathew is currently active in, or previously a member of, the International Society for Cell Therapy (ISCT), AABB (formerly the American Association of Blood Banks), BEST (the Biomedical Excellence for Safer Transfusion collaborative), Tissue Engineering & Regenerative Medicine International Society (TERMIS), Society for Cryobiology, International Society for Biological and Environmental Repositories (ISBER), American Society for Cell Biology, and the Society for In Vitro Biology.

Mark Sandifer
Vice President of Quality

Mark′s background is in drug development and clinical administration. He has more than ten years of experience in quality assurance. His keen interest in how the quality aspects of our products support cell therapies comes from his work with Georgetown University Medical Center′s bone marrow transplant program in association with the National Marrow Donor Program. He directed BioLife′s effort in achieving ISO 13485:2003 certification and led the team effort in ISO 14644 qualification of BioLife′s CGMP production facility. Mark holds an M.S. in Biotechnology from Johns Hopkins University and a B.S. in Biology from George Mason University.

Daphne Taylor
Vice President, Finance & Administration, Chief Financial Officer

Daphne Taylor has served as Vice President, Finance & Administration, and Chief Financial Officer since August 2011. She has 20 years experience as a finance professional. Prior to joining BioLife, Ms. Taylor served as Vice President, Corporate Controller and Chief Accounting Officer of Cardiac Science Corporation from November 2005 through January 2009. From April 2002 through November 2005, she held various positions, including Vice President and Corporate Controller for LookSmart, a publicly held Internet technology company. In 2001, Ms. Taylor was Controller at SpeedTrak Communications and prior to that she was Controller for ViroLogic, a publicly held biotechnology company. Ms. Taylor held various finance positions at Core-Mark International, a distribution company, from 1996 to 2000. From 1991 to 1994, she was in public accounting with Coopers & Lybrand and is a licensed CPA. Ms. Taylor holds a B.A. in Management/Accounting from Sonoma State University, California.

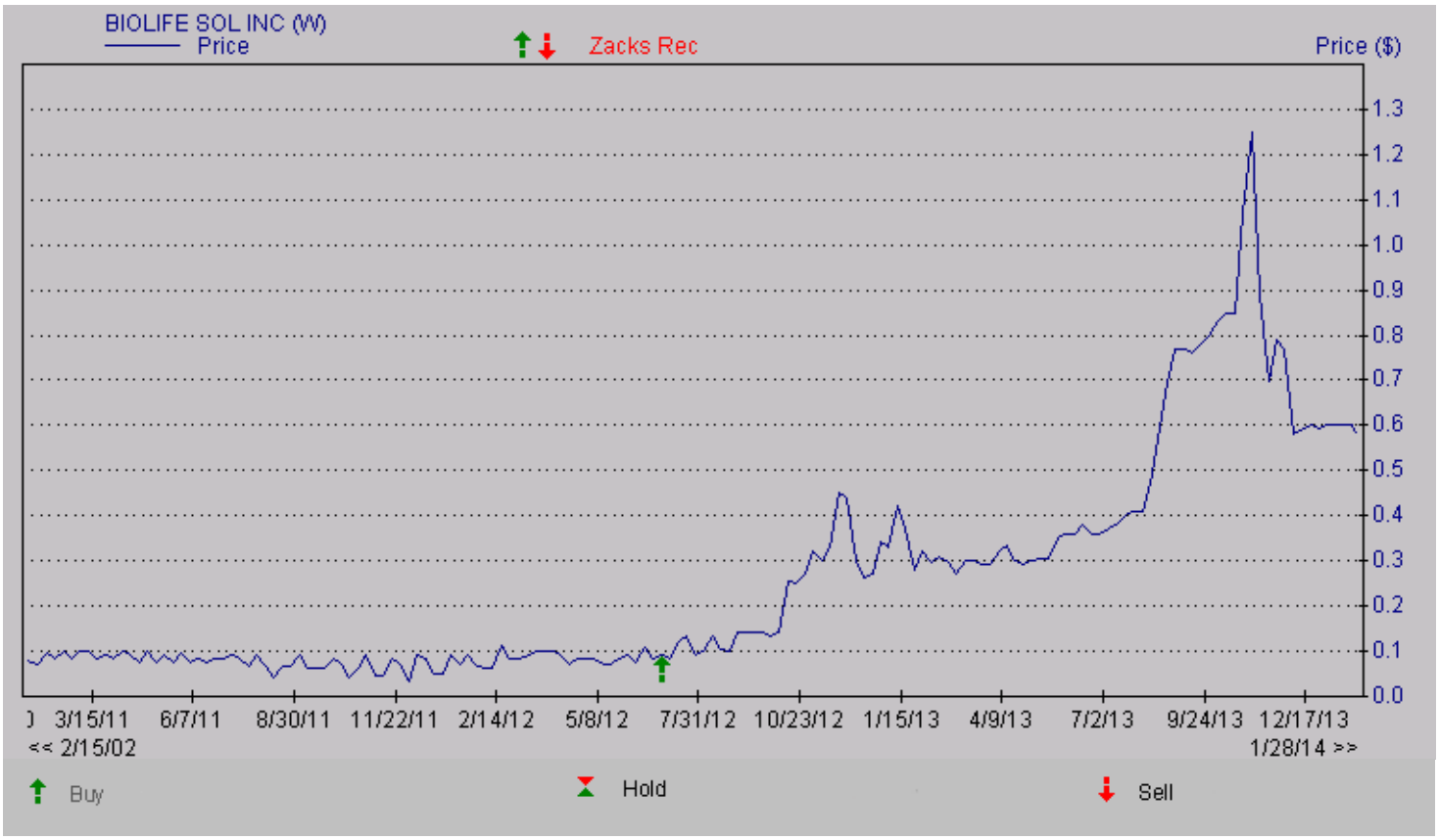
Joe Annicchiarico
Director of Manufacturing

Joe joined BioLife Solutions in December 2011 after serving for six years at MediQuest Therapeutics, Inc. in Bothell, Washington, where he was an integral part of the company′s first NDA filing. He spearheaded process scale-up and validation efforts, patent protection, and clinical trial supply chain management. His tenure at MediQuest included time as a Scientist, Formulation Manager, and most recently, as Director of Manufacturing and Clinical Supplies. Prior to his tenure at MediQuest, he worked in speciality chemical sales at Drummond American and spent four years as a formulation

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development Chemist at a pair of personal care products companies in New Jersey. Joe earned his Bachelor's Degree in Biology from The Johns Hopkins University in Baltimore, Maryland, in 1997.

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