

# Pressure BioSciences, Inc.



*“Discovery Starts with  
Sample Preparation”*

**June 2015**

**Not Confidential**

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# Executive Summary

Pressure BioSciences, Inc.

June 2015

Pressure BioSciences, Inc. (“PBI”) is a publicly-traded company (OTCQB: P BIO) focused on solving the challenging problems inherent in biological sample preparation, a crucial laboratory step performed by an estimated 500,000 scientists worldwide working in biological life sciences research.

Sample preparation is a term that refers to a wide range of activities that precede virtually all forms of scientific analysis. Sample preparation is often complex, time-consuming, and one of the most error-prone steps of scientific research. It is none-the-less a ubiquitous laboratory undertaking whose requirements drive a large and growing market, worldwide.

We have developed and patented a novel, enabling technology platform that can exquisitely control the sample preparation process. It is based on harnessing the unique properties of an entirely new dimension in thermodynamics for life sciences laboratories – cycled hydrostatic pressure. This cutting-edge process, called pressure cycling technology (“PCT”), uses alternating cycles of hydrostatic pressure between ambient and ultra-high levels (up to 100,000 psi) to safely, conveniently, and reproducibly control the actions of molecules in biological samples (e.g., cells and tissues from human, animal, plant, and microbial sources).

We began operations in 2006, following the sale of our parent company Boston Biomedica, Inc. (NASDAQ: BBII). Initial sales of our instruments began in 2008, and consisted of prototype and first generation units. From 2008 to present, with the information continuously received from the customers of our early generation instruments, we developed a number of PCT-based products for use by the life sciences’ market, including five pressure generating instruments (“Barocyclers”), a unique patent-pending, mechanical sample homogenization device (the “PCT Shredder”), six unique, single-use processing containers (PULSE Tubes, MicroTubes, BaroFlex 8-well processing strips, and Shredder Tubes), six different reagent kits, and a number of ready-to-use, application-specific protocols. Many of these products and protocols are covered by claims in our 24 issued US and foreign patents. We have additional patent applications on file.

We believe the overall market for biological sample preparation products is very large. As stated, virtually every laboratory engaged in any form of biological research is faced with the necessity of routinely preparing samples prior to testing and analysis. The Emmes Group (2008) estimated that this market is comprised of up to 80,000 laboratories and 500,000 researchers worldwide. A report produced by BCC Research LLC, a well-regarded provider of market intelligence, estimated that the global market for sample preparation reagents and products used in life science research was \$4.6 billion in 2012 and is expected to reach \$5.4 billion in 2013. BCC Research projects the market to grow to \$11.5 billion by 2018, and register a five-year compound annual growth rate (CAGR) of 16.3% from 2013 to 2018.

There are a number of existing methods used by scientists for biological sample preparation, including mortar and pestle grinding, sonication, homogenization, and bead beating. We believe that PCT offers significant advantages over these methods, including safety, speed, reproducibility, versatility, and ease-of-use, often with a substantial increase in the quality of the final results. There are a growing number of scientific publications and presentations from independent laboratories that we believe highlight and confirm these clear advantages of PCT over other current methods.

Our primary efforts are focused on the development and sale of PCT-based products and applications for the preparation of samples used in the discovery of biomarkers. Biomarkers are molecules (e.g., genes, proteins, lipids) found in tissue (e.g., cells) or body fluids (e.g., blood) that correlate – directly or indirectly – with the presence or absence, the progression or recurrence, and/or the effects of treatment on a disease or a disorder. Examples of biomarkers are PSA (prostate cancer), LDL Cholesterol (coronary heart disease), Her-2/neu (breast cancer), and anti-HIV (AIDS infection).

The discovery of biomarkers is a primary focus of thousands of scientific researchers worldwide. These researchers work in academic, government, biotechnology, and pharmaceutical laboratories. A 2012 market research report by ASDReports has estimated the worldwide market for biomarkers to be approximately \$26 billion.

The primary instrument used in the discovery of protein biomarkers is the mass spectrometer, a powerful laboratory instrument that is playing an increasingly important role in the analysis of biological samples in life sciences research. We believe that mass spectrometry is a multi-billion dollar market, and that PCT offers significant advantages in speed and quality compared to current techniques used in the preparation of samples for mass spectrometry.

Other strategic areas in biological sample preparation where we have seen encouraging market penetration of our PCT-based products, and where we are focusing the remainder of our efforts, are in PCT-enhanced applications in soil/plant biology, forensics, histology, and counter-bioterror applications.

We derive our revenue from the sale, lease, or rental of our five Barocycler instruments, as well as from the recurring purchase of consumables required for the PCT process, including single-use processing containers (PULSE Tubes, MicroTubes, BaroFlex 8-well processing strips, and Shredder Tubes) and reagent kits. We also derive revenue from instrument service contracts, replacement instrument parts, and grants. Recently, we have also begun to derive revenue from the sale of pressure-based cell disruption instruments and associated consumables used for larger scale sample processing. These pressure-based products are provided to us by Constant Systems LLC, a strategic partner of ours from the UK.

We believe that there are approximately 80,000 laboratories worldwide that require the extraction of DNA, RNA, proteins, lipids, and small molecules from biological samples for their research studies. Based on market research, our results to date, and the fact that PCT is a novel, cutting-edge technology currently uncontested in the field of small volume, high pressure preparation of research samples, we believe that a large number of these laboratories will benefit from the advantages of the PCT Sample Preparation System. We believe that we can capture a reasonable share of this existing market over the next 3-5 years, and that by doing so, we will become a highly respected and profitable life sciences instrument and consumables provider.

We have installed approximately 250 PCT Sample Preparation Systems (Barocycler instruments plus required consumables, or “PCT Systems”) through March 31, 2015. Revenue for FY 2011 was approximately \$988,000. Revenue for FY 2012 was approximately \$1,238,000. Revenue for FY 2013 was approximately \$1,503,000, a 21% increase over revenue for the same period in 2012. Revenue for FY 2014 was \$1,374,744, of which \$1,350,150 was derived product sales, compared to product sales of \$1,046,678 in FY 2013, an increase of nearly 30%. We achieved these strong financial results with a small, two-person sales and marketing team to support our commercialization effort. During this time, our focus has not only been in the generation of revenue, but also in making significant developments and improvements in our instrumentation and consumables, in the development of applications for our PCT Platform, in generating proprietary data and filing patents, and in working with clients to support their efforts in publishing and presenting PCT generated data.

Our current customers include government agencies and research institutions, such as the Food and Drug Administration (FDA), Federal Bureau of Investigation (FBI), National Institutes of Health (NIH), Centers for Disease Control (CDC), US Department of Agriculture (USDA), the VA Hospital System, US Army Medical Research Institute of Infectious Diseases (USAMRIID), and Pacific Northwest National Laboratories (PNNL). We have also installed PCT Systems in academia, such as the Harvard School of Public Health, UC – San Diego, UCLA, George Mason University, Thomas Jefferson University School of Medicine, the Barnett Institute of Northeastern University, Vanderbilt University, Florida International University, the University of New Hampshire, and Lawrence Berkeley National Laboratory. In addition, we also have diagnostic, biotechnology, and pharmaceutical customers, including Amgen, Novartis, Biogen, Merck, Monsanto, Bristol Myers-Squibb, Thermo Fisher Scientific, and Target Discovery.

Recently, important data have been presented by independent scientists from the US and international research communities on the advantages of PCT compared to existing, competitive methods for biological sample preparation. These presentations have been in the areas of cancer biomarker discovery, drug development, stroke, forensic sciences, counter-bioterror, soil and plant biology, extraction of biomolecules from microorganisms (i.e., oil-eating bacteria), and PCT-enhanced protein digestion. Data from these various applications have been presented at scientific meetings by researchers from Thermo Fisher, PNNL, Amgen, USAMRIID, the USDA, Harvard School of Public Health, Lawrence Berkeley National Lab, the University of North Texas, Merck, and Target Discovery. These presentations are part of over 100 scientific publications that can be found on our website.

In June 2013, we announced a core technology breakthrough, a game-changing achievement we believe has the potential to significantly increase our ability to secure financing, and to accelerate growth in our existing product line, installed base, sales reach, strategic partnerships, and overall revenue stream. This breakthrough relates to the achievement of objectives in our multi-year investment into the development of a high throughput (“HT”) PCT System (the “Barozyme HT48”). We believe the new HT design will allow our PCT platform to integrate with the automated, universally accepted HT sample preparation and analytical system formats installed in tens of thousands of biological research laboratories worldwide. We believe this breakthrough has the potential to significantly accelerate our ability to attract and form new strategic partnerships, which should accelerate our overall revenue ramp. We finished the development of the new Barozyme HT48 in late 2014. Independent evaluations began in November 2014. The first sale of one of the three evaluations units occurred in February 2015.

Also in 2013 we reported other noteworthy achievements, including: (i) the development by a Harvard-led research team of a novel, non-invasive, PCT-enhanced method for lipid analysis using fecal material, (ii) the presentation by UCLA scientists of an advanced, pressure-based method offering new insights into protein structure and function for use in biomarker discovery and rational drug design, (iii) the closing of our Series J Private Placement at a total investment level that was slightly over our goal of \$2.0 million, (iv) the initiation of equity research coverage on PBI by Merriman Capital and See-Thru-Equity, and (v) publication of an Executive Informational Overview on PBI by Crystal Research Associates, led by top-ranked Wall Street veterans Jeffrey Kraws and Karen Goldfarb.

On June 15, 2014 we unveiled our newest Barocycler instrument, the first-in-class, high throughput Barozyme HT48 for the enhanced preparation of proteins for mass spectrometry analysis. The bench-top Barozyme HT48 is capable of processing up to 48 samples simultaneously using the Company’s new and proprietary BaroFlex 8-well processing strips. The BaroFlex strips were designed and manufactured to the industry-standard micro-titer plate format, which the Company believes will allow the new Barozyme HT48 system to integrate directly with the automated, standardized, high throughput liquid handling robotic and analytical systems installed in tens of thousands of biological research laboratories worldwide. The Company believes the Barozyme HT48 High Throughput System can significantly fuel growth and increase revenue for existing and new PCT-based applications and products, and greatly facilitate the commencement of new strategic partnerships.

Also in 2014 we continued with the development of our sales and marketing strategy, which included increasing the Company's internal direct sales persons and marketing staff during FY 2015, combined with the sales and marketing capabilities of one or more strategic partners in specific areas of the life sciences. We believe that PCT is best suited for partnerships with companies already in the spectroscopy (NMR, EPR, CD, Mass Spec) and forensics areas; we are currently talking with significant players in both.

We have a sharp, strategic focus and business plan that we believe gives us a realistic opportunity to successfully reach our short and long-term business goals, which include:

Consistent revenue growth with concomitant operating cost reductions

Completion of third-party evaluation of our two new instrument systems in the first half of 2015 (the Barocyler HUB880 and the Barozyme HT48 high throughput system), followed by the sale of these systems during the second half of 2015.

A significant strategic alliance with one or more marketing/distribution partners in 2015

Strong, growing presence with particular focus in the biomarker discovery and forensics markets

Continued market acceptance of PCT through the publication and presentation of independent data by scientific leaders who are both collaborators and customers

Increased shareholder value

Profitability

Although we expect to maintain a sharpened focus on our short and long-term business goals going forward, we believe that our strong IP and proprietary positions in other areas, such as the potential of using enhanced enzymatic reactions in the area of bio-fuel development, using PCT for the inactivation of pathogens, and using PCT in other important areas of sample preparation, lend themselves well for licensing possibilities. We plan to pursue this avenue during 2015 and beyond.

We believe that our estimated, current average cash burn is approximately \$750,000 per quarter. We believe our cash burn will decrease significantly over the second half of 2015 and into 2016, based on our guidance that revenue will increase sharply over this period of time. On July 23, 2015, we announced the initial close (\$2.18M) of a \$5M Regulation D Exempt PIPE. We expect to complete the PIPE by mid-October 2015. The primary Use-of-Funds for the PIPE are to pay-off all outstanding debt and to hire a sales and marketing team of approximately six personnel. With the cash from this financing, we believe we will have sufficient capital to fund our continuing operations into 2016, achieve our strategic business goals, and be well on the path to profitability in the near future.

We have also announced our expectation to up-list the Company to a regulated exchange by late 2015 or early 2016.

Investment highlights include:

- Novel, enabling, powerful patent protected technology
- Recent technology breakthrough (HT capability) a "game changer"
- Highly experienced management team, Board of Directors, and support staff
- Core technology developed and field proven

- Product pipeline includes instruments that offer the advantages of PCT in automated, on-demand, in-line, and /or high throughput system Early market traction with approximately 250 installations through June 30, 2015 in academia, government, biotech, and pharmaceutical companies
- Barocycler instrumentation is CE registered and ETL certified
- An increase in independently generated data from scientific thought leaders highlighting the significant advantages of PCT compared to other current methods of biological sample preparation supporting the advantages of PCT has been seen recently and is expected to continue
- Large and growing market for biological sample preparation products
- Strong strategic alliance opportunities with major marketing/distribution partners
- Successful collaborations on-going with recognized thought leaders in the field
- Attractive business model with upfront sales and a recurring revenue stream
- Sharp, focused, and achievable business goals in 2015 and beyond

As we work to further develop pressure cycling technology and the PCT-based product line with our collaborators and customers, we believe that our efforts will increase the quality of research and speed the time to scientific discovery, which in turn will improve healthcare and save lives, worldwide.

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