

Pressure BioSciences, Inc. Announces Launch of Its *PCT MicroTube™ Adapter Kit for Enhanced Enzymatic Proteolysis at the American Society for Mass Spectrometry (ASMS)*

Pressure Biosciences, Inc. Announces the Much Anticipated, Next Generation Sample Preparation Product: The PCT MicroTube Adapter Kit

South Easton, MA, May 29, 2009 – Pressure BioSciences, Inc. (NASDAQ: PBI) (“PBI” and the “Company”) today announced that it will unveil and release for sale its PCT MicroTube Adapter Kit (patent pending) at the 57th Annual Conference of the American Society for Mass Spectrometry (ASMS), to be held at the Pennsylvania Convention Center (Philadelphia, PA) from May 31 – June 4, 2009. Approximately 6,500 scientists are expected to attend the ASMS Conference. There will be at least six presentations by independent scientists on the advantages of the Company’s unique and patented pressure cycling technology (“PCT”) and/or its new PCT MicroTube Adapter Kit in mass spec studies.

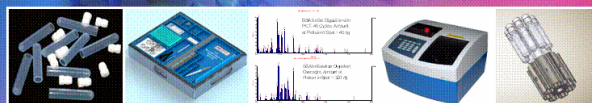
The PCT MicroTube Adapter Kit includes an ergonomically designed, space-saving Workstation, PCT MicroTubes and MicroCaps, and specialized tools to enable the user to process up to forty-eight samples simultaneously in the Company’s primary product, the PCT Sample Preparation System (“PCT SPS”), as compared to three currently. We believe that this satisfies the desired sample volume and throughput requirements of most proteomic laboratories. The new PCT MicroTube is made of a state-of-the-art polymer with unique features that separate it from competitive products, including extreme chemical resistance, broad useable temperature range, non-wetting surface, negligible protein and nucleic acid binding, and the ability to efficiently transmit pressure from the pressure generating instrument (“Barocycler”) to the sample. The new PCT Microcap was designed with an added feature to allow it to easily excise and transfer protein gel spots to the PCT MicroTube for processing, a necessary function in many mass spec labs that is currently done by cutting the protein spots out by hand, or by expensive robotic systems.

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Protein Digestion in Minutes! Learn about PCT MicroTube Adapter Kit For Enhanced Enzymatic Proteolysis Visit

Pressure BioSciences
Booth #156
[57th ASMS Conference on Mass Spectrometry](#)
Pennsylvania Convention Center
May 31 - June 4, 2009
Philadelphia, Pennsylvania

Protein Digestion in Minutes with the PCT MicroTube Adapter Kit for Enhanced Enzymatic Proteolysis



Pressure Cycling Technology (PCT)

- Standardize Protein Digestion for Mass Spectrometry
- Substantially Increase Protein Digestion Efficiency
- Significantly Accelerate In-Solution or In-Gel Protein Digestion
- Promote Accurate & Efficient Protein Cleavage
- Avoid Undesired Protein Modifications
- Process Up to 48 Samples at a Time
- Versatile Range of Small Sample Sizes (50-150 µL)
- Compatible with a Variety of Proteolytic Enzymes
- Inert, Non-Wetting, Single-Use MicroTube Processing Containers
- Unique MicroCap Design for Protein Spot Transfer from 2D Gels

CALENDAR OF EVENTS

2009 APS ANNUAL MEETING	8TH HUPO WORLD CONGRESS
Portland, Oregon	Toronto, Canada
August 1-5, 2009	Sept. 26th-30th, 2009

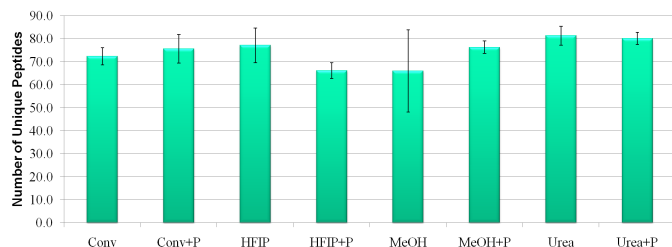
**Poster Excerpt from MASSEP Symposium 2009
Optimization of Rapid Protein Digestion Using
Pressure Cycling Technology**

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1Pressure BioSciences, South Easton, MA ; 2Harvard School of Public Health, Boston, MA

Introduction

Hydrostatic pressure has been previously shown to enhance enzymatic hydrolysis by trypsin [1,2], chymotrypsin and pepsin [3,4], as well as by Alcalase, Neutrase, Corolase 7089, Corolase PN-L, and papain [5,6]. In our preliminary experiments we have confirmed the positive effects of pressure and additional benefits of alternating hydrostatic pressure (pressure cycling) for several enzymes including proteinase K, PNGase F, Lys-C and lysozyme. However, mechanisms of pressure-induced acceleration remain speculative, while influence of various chemical agents on the enzymatic activity, substrate conformation and efficiency of the digestion process are not well understood, which leads to great variability of experimental results between groups which have attempted to employ PCT-enhanced digestion methods. In this work we explore stability and catalytic activity of trypsin and chymotrypsin under the influence of several chaotropes and organic solvents in combination with hydrostatic pressure at various temperatures. We have employed chromogenic substrates to measure enzyme activity independent of pressure-induced changes of substrate protein conformation. Additionally, using high performance LC-MS analysis, we have tested the effect of the factors outlined above on efficiency, selectivity, and throughput of proteolytic digestion. Analysis of the data obtained thus far leads to a set of guidelines for development of optimized and highly reproducible pressure-enhanced digestion methods.

Optimization of Protein Digestion. Peptide Identification.



Number of identified unique peptides. Digestion in 2M Urea, 25% Methanol and 7% HFIP has been compared to the overnight digestion in 50mM ammonium bicarbonate (Conv); +P denotes PCT treatment for 30 minutes at 35,000 psi. Lower peptide counts for urea and HFIP digests under pressure are consistent with suboptimal enzyme activity. Decrease in concentration of these reagents is expected to further improve digestion results.

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**Attend the
ASMS Poster Sessions
to
Learn More About
Pressure Cycling Technology (PCT)
and
PCT MicroTube Adapter Kit
For Enhanced Enzymatic Proteolysis**

Session: Microbial Analysis Code: ThPO Poster 381
Top-Down Identification of Bacterial Intact Protein Expression Profile Markers

Melinda A. McFarland; John H. Callahan; Denis Andrzejewski; Rebecca Bell; Steven M. Musser
FDA/CFSAN, College Park, MD

Session: Proteomics New Approach Code: TPE Poster 125
Ultra-Rapid Pressure Digestion and Label-Free Quantitative Proteomics of Yersinia Infected Mice Tissues

Kim K. Hixson¹; Daniel Lopez Ferrer¹; Matthew Bender²; Patricia L. Worsham³; Karl K. Weitz¹; Nate Lawrence⁴; Amy Rasley⁵; Therese W. Clauss¹; Ljiljana Pasa-tolic¹; Richard D. Smith¹; Mary S. Lipton¹
¹Pacific Northwest National Lab, Richland, WA; ²NBACC, Washington, DC; ³USAMRIID, Frederick, MD; ⁴Pressure Biosciences, Inc., South Easton, MA; ⁵Lawrence Livermore National Lab, Livermore, CA

Session: Proteomics New Approach Code: ThPD Poster 103
Improved Protein Coverage and Throughput in Proteomics Using On-Line Multiplexed Enzyme Digestions and Targeted MSMS with a Modified LTQ-FTICR

Daniel Lopez Ferrer¹; Konstantinos Petritis¹; Andrei Liyu¹; Yufeng Shen¹; Benito Canas²; Kim K. Hixson¹; Richard D. Smith¹; Mikhail Belov¹
¹PNNL / Battelle Northwest, Richland, WA; ²Universidad Complutense de Madrid, Madrid, Spain

Session: Proteomics New Approach Code: TPE Poster 132
High-pressure assisted in-gel tryptic digest: qualitative and quantitative aspects

Michail Alterman¹; Melkamu Getie-Kebtie¹; Alexander Lazarev²; Vera S. Gross²
¹FDA, CBER, Rockville, MD; ²Pressure Biosciences, Inc, Woburn, MA;

Session: Proteomics New Approach Code: TPE Poster 129
Proteomics under pressure: Rapid extraction and digestion in a single tube

ALEXANDER V. LAZAREV¹; Emily Freeman²; Vera S. Gross¹; Greta Carlson¹; Edmund Ting¹; Alexander R. Ivanov²



Press Release Continued:

We believe that the PCT MicroTube Adapter Kit, in combination with the PCT SPS, can reliably increase the quality and decrease the cost of sample preparation for the mass spectrometry field. Additionally, we believe that the small volume, high throughput PCT MicroTube consumable will broaden the use of PCT into areas of proteomic and genomic sample preparation outside of mass spectrometry, such as biomarker discovery, plant and animal biology, and forensics.

The Emmes Group (2008) estimates the biological sample preparation market to be comprised of up to 80,000 laboratories and 500,000 researchers worldwide. Since 2007, PBI has installed over 75 PCT Sample Preparation Systems ("PCT SPS") into this market, primarily for the preparation of biological samples for scientific research purposes by laboratories outside of the mass spectrometry field. However, recent presentations by several independent, well-known scientists have demonstrated that PCT offers unique benefits over current methods in the preparation of samples for downstream mass spectrometry analysis. These benefits include a significant reduction in processing time (hours to minutes), a reduction in undesired protein modifications, an increase in protein digestion efficiency, and the opportunity for PCT to be used to standardize sample preparation for the field of mass spectrometry. To capitalize on these and other competitive advantages, and to enable the Company to better expand its PCT customer base into the mass spectrometry market, the PCT MicroTube Adapter Kit was developed.

Dr. Shane Burgess, Director of the Life Science and Biotechnology Institute at Mississippi State University, and a Beta Site tester of the PCT MicroTube Adapter Kit, said: "PCT offers clear advantages over our standard method of sample preparation, including shorter processing time, higher throughput, and reduced operating costs – and all without sacrificing quality. In addition, although we have yet to confirm this, our data lead me to believe that PCT may also improve the number of proteolytic peptides we can identify in each preparation. In all, we found these advantages so significant that we recently incorporated PCT into our standard mass spec proteomics analysis workflow. We also believe that throughput will continue to increase, and operating costs will continue to decline, once we incorporate the new MicroTube Adapter Kit into our normal operation, which we plan to do as soon as possible."

Dr. Alexander R. Ivanov of the Harvard School of Public Health, and another Beta Site tester of the PCT MicroTube Adapter Kit, commented: "Data generated in our laboratory over the past few months show that PCT results in the identification of more unique peptides than our standard sample preparation technique for mass spectrometry. Our data also indicate that PCT may be highly successful in digesting very complex samples, an area of great difficulty at the present time. These advantages, coupled with the unique characteristics of the new PCT MicroTubes and PCT MicroCaps that we evaluated over the past several months, offer scientists working in proteomics, especially in mass spectrometry, a wonderful new tool for scientific discovery."

Dr. Edmund Ting, Senior Vice President of Engineering for PBI, said: "We paid attention to the needs of the sample preparation scientist and developed an innovative solution for the high throughput processing of micro-liter sized samples using cycled high pressure. We believe that this patent pending sample containment and processing system, combined with the unique power of PCT, gives the researcher extraordinary ability to gain new knowledge using today's analytical identification techniques, such as mass spectrometry. Based on the results from our Beta Site tests, we believe that our PCT MicroTube Adapter Kit can benefit a large segment of the proteomics and genomics research community."

Optimization of Rapid Protein Digestion Using Pressure Cycling Technology (Continued)

Conclusions

Pressure cycling has been shown to significantly improve proteolysis with a number of enzymes. High hydrostatic pressure acts synergistically with chaotropes and organic solvents to boost the effects of these chemicals on protein denaturation and digestion. These effects not only improve digestion efficiency and save significant time, but also allow the use of much lower concentrations of denaturants, which can simplify and improve downstream applications. While such effects are clearly beneficial, care must be taken in development of PCT-enhanced digestion methods to avoid impairment of enzymatic activity due to denaturation of the enzyme itself. The following points illustrate some of our recent findings:

1. Chymotrypsin activity can be significantly enhanced by performing digestion using cycled pressure.
2. Under cycled pressure, 0.5 M Guanidine-HCl inhibits trypsin but not chymotrypsin activities.
3. Under cycled pressure, 4% HFIP enhances trypsin but inhibits chymotrypsin activities.
4. Pressure levels above 20,000 psi exhibit negative effect on trypsin activity.
5. Under cycled pressure, trifluoroethanol below 15% enhances trypsin but inhibits chymotrypsin activities (data not shown).
6. Under cycled pressure, both methanol and urea can be included in trypsin digests at low concentration, but become rapidly inhibitory at higher concentrations.

Press Release Continued:

Forward Looking Statements

Statements contained in this press release regarding the Company's intentions, hopes, beliefs, expectations, or predictions of the future are "forward-looking" statements within the meaning of the Private Securities Litigation Reform Act of 1995. Forward looking statements include statements regarding the expected commercial release of the Company's PCT MicroTube Adapter Kit; the expectation that the ASMS annual conference will have 6,500 attendees and at least six presentations that will discuss the advantages of PCT and/or the PCT MicroTube Adapter Kit; the advantages, benefits, capabilities, and features of PCT and the PCT MicroTube Adapter Kit, including speed, reduction in undesired protein modifications, reduction in sample preparation costs, an increase in protein digestion efficiency, the inertness and non-wetting characteristics of the MicroTube, and the use of the MicroCap as a protein spot picker and transfer device; and the potential markets for the Company's PCT-based products. These statements are based upon the Company's current expectations, forecasts, and assumptions that are subject to risks, uncertainties, and other factors that could cause actual outcomes and results to differ materially from those indicated by these forward-looking statements. These risks, uncertainties, and other factors include, but are not limited to: the risk that the Company may not release the new PCT MicroTube Adapter Kit on May 31st, or anytime; possible difficulties or delays in the implementation of the Company's strategies that may adversely affect the Company's continued commercialization of PCT; changes in customer's needs and technological innovations; the Company's sales force may not be successful in selling the Company's PCT product line because scientists may not perceive the advantages of PCT over other sample preparation methods, particularly in the mass spectrometry market; and scientists may not be able to duplicate the results achieved at particular laboratories having already used PCT and/or the PCT MicroTube Adapter Kit. Further, the Company expects that it will need additional capital to fund its continuing operations beyond the second quarter of 2010. Additional risks and uncertainties that could cause actual results to differ materially from those indicated by these forward-looking statements are discussed under the heading "Risk Factors" in the Company's Annual Report on Form 10-K for the year ended December 31, 2008, and other reports filed by the Company from time to time with the SEC. The Company undertakes no obligation to update any of the information included in this release, except as otherwise required by law.

Visit us at our website <http://www.pressurebiosciences.com>