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Pressure BioSciences Novel UST Platform Delivers Breakthrough Nanoemulsion Processing for One of the World's Most Potent Antioxidants - Astaxanthin

Unprecedentedly Tiny, Uniform, and Stable Nanoemulsified Oil Droplets Containing Astaxanthin Expected to Significantly Increase Oral and Topical Absorption of this Antioxidant 6,000x More Powerful Than Vitamin C

SOUTH EASTON, MA / ACCESSWIRE / July 1, 2021 /Pressure BioSciences, Inc. (OTCQB:PBIO) ("PBI" or the "Company"), a leader in the development and sale of broadly enabling, pressure-based instruments, consumables, and platform technology solutions to the worldwide biotechnology, biotherapeutics, cosmeceuticals, nutraceuticals, and food & beverage industries, today announced the application of its Ultra Shear Technology™ ("UST™") platform for the development of more potent formulations of wide-ranging nutraceuticals of high therapeutic value, allowing for more controlled dosing and opportunities for lower cost solutions for both manufacturers and consumers. Specifically, the Company reported breakthrough results in processing one of the most powerful antioxidants known to science, astaxanthin ("AsX"), in extremely fine and uniform, monodisperse nanoemulsions of oil in water - critically important for fast and efficient absorption by the water-based biochemistry of humans and animals.

Astaxanthin is a natural red pigment produced by the microalgae [Haematococcus pluvialis](#). It is responsible for the red coloration of krill and other crustaceans, and in turn, the familiar coloration of salmon and flamingos which feed on them.

As an antioxidant, AsX is 6000 times more powerful than vitamin C, 800 times more powerful than CoQ10, and 100 times more powerful than vitamin E [1]. In clinical studies, AsX has been shown to neutralize free radicals, greatly reducing oxidative stress [2], enhance natural immune response [3], improve muscle endurance and exercise performance [4], support cardiovascular, neural/cognitive and ocular health [5, 6, 7], protect skin against UV damage and premature aging [8], favorably modulate specific cell signaling pathways involved in cancer cell death [9], and even improve sperm motility in male infertility. Recent studies have suggested that AsX may help alleviate progression of COVID-19 into severe cytokine storm condition [10,11]. Further, AsX can cross the blood-brain barrier and has been shown to increase gene expression of several proteins known to be involved in injured brain recovery [12].

It is particularly important for antioxidants be water-soluble, allowing them to circulate freely through the blood. However, because AsX is oil-based and intrinsically water-insoluble, oral/gastrointestinal and topical absorption of AsX is typically less than 10%, unless it is effectively solubilized in dietary fats or provided in a lipid-based formulation [13]. Even then,

AsX in oil is typically delivered in large droplets that pass through the body with very low overall absorption efficiency.

Gary B. Smejkal, Senior Research Scientist at PBI, explained the breakthrough achieved by the Company: "Nanoemulsions produced by PBI's UST platform encapsulate AsX in extremely small oil droplets ranging in size from 30-60 nm in diameter [14]. Because these particles are so small, they do not scatter light and thus appear as clear ruby red liquids that disperse freely in water or other clear beverages. The enhanced oral bioavailability of AsX corresponding to droplet size reduction is well-established and has been published [15].

Mr. Smejkal continued: "Our initial stability studies have already shown that UST-processed AsX nanoemulsions are stable for at least four months at room temperature without any measurable change in oil droplet size, coalescence, or phase separation. We used AsX as a model compound to demonstrate the power of our UST platform technology. Our approach will be readily suitable to prepare nanoemulsions of other carotenoids and a wide range of fat-soluble vitamins and dietary supplements. We believe that the implications of PBI's UST platform for AsX and for a multitude of other oil-soluble nutraceuticals will undoubtedly be dramatic in the marketplace."

Mr. Richard T. Schumacher, President & CEO of PBI, commented: "The global astaxanthin market size was estimated at USD 1.0 billion in 2019 [16]. PBI is laser-focused on exploring the opportunities for our UST platform to profoundly alter the effectiveness and competitiveness of a great number of lucrative nutraceutical products. We have already begun discussions with prospective partners worldwide who are interested in using UST for production and commercialization of astaxanthin and other nutraceutical nanoemulsions. We remain optimistic that we will meet our stated goal of releasing our initial UST-based instrument to the market before the end of 2021. As previously announced, we intend to make this system available through a lease/royalty business model."

About Pressure BioSciences, Inc.

Pressure BioSciences, Inc. (OTCQB:PBIO) is a leader in the development and sale of innovative, broadly enabling, pressure-based solutions for the worldwide life sciences and other industries. Our products are based on the unique properties of both constant (i.e., static) and alternating (i.e., pressure cycling technology, or PCT) hydrostatic pressure. PCT is a patented enabling technology platform that uses alternating cycles of hydrostatic pressure between ambient and ultra-high levels to control bio-molecular interactions safely and reproducibly (e.g., cell lysis, biomolecule extraction). Our primary focus is the development of PCT-based products for biomarker and target discovery, drug design and development, biotherapeutics characterization and quality control, soil & plant biology, forensics, and counter-bioterror applications. Additionally, major new market opportunities have emerged in the use of our pressure-based technologies in the following areas: (1) the use of our recently acquired, patented technology from BaroFold, Inc. (the "BaroFold" technology) to allow entry into the bio-pharma contract services sector, and (2) the use of our recently-patented, scalable, high-efficiency, pressure-based Ultra Shear Technology ("UST") platform to (i) create stable nanoemulsions of otherwise immiscible fluids (e.g., oils and water) and to (ii) prepare higher quality, homogenized, extended shelf-life or room temperature stable low-acid liquid foods that cannot be effectively preserved using existing non-thermal technologies.

Forward Looking Statements

This press release contains forward-looking statements. These statements relate to future events or our future financial performance and involve known and unknown risks, uncertainties and other factors that may cause our or our industry's actual results, levels of activity, performance, or achievements to be materially different from any future results, levels of activity, performance or achievements expressed, implied, or inferred by these forward-looking statements. In some cases, you can identify forward-looking statements by terminology such as "may," "will," "should," "could," "would," "expects," "plans," "intends," "anticipates," "believes," estimates," "predicts," "projects," "potential" or "continue" or the negative of such terms and other comparable terminology. These statements are only predictions based on our current expectations and projections about future events. You should not place undue reliance on these statements. In evaluating these statements, you should specifically consider various factors. Actual events or results may differ materially. These and other factors may cause our actual results to differ materially from any forward-looking statement. These risks, uncertainties, and other factors include, but are not limited to, the risks and uncertainties discussed under the heading "Risk Factors" in the Company's Annual Report on Form 10-K for the year ended December 31, 2020, 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.

For more information about PBI and this press release, please click on the following website link:

<http://www.pressurebiosciences.com>

Please visit us on Facebook, LinkedIn, and Twitter.

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