



New clinical trial shows uniquely-derived strawberry and cranberry polyphenols may improve insulin sensitivity for people with pre-diabetes

Research shows promising improvements in blood sugar profiles for non-diabetic, insulin-resistant adults when given GlucoPhenol®

Montreal, Canada, April 7, 2017 — Researchers at the Institute of Nutrition and Functional Foods (INAF) at Laval University have found a potential new approach to help people with prediabetes stave off the progression of this chronic disease. In a study made available today in the *British Journal of Nutrition*, GlucoPhenol®, a proprietary blend of cranberry and Orléans strawberry extracts, produced significant improvements in insulin sensitivity among non-diabetic, insulin-resistant adults. Globally, 415 million adults are living with diabetes¹ and these numbers are projected to grow to 592 million by 2035, affecting one in every ten adults. According to the most recent data from the American Diabetes Association, in the United States alone, an estimated 29.1 million adults have diabetes, while another 86 million are classified as prediabetic.²

The research team at INAF, led by H el ene Jacques, PhD, undertook the study to determine the effects of polyphenols from strawberries and cranberries on insulin sensitivity, glucose tolerance and insulin secretion in free-living insulin-resistant men and women who are overweight or obese but otherwise healthy.²

“Our data indicate that GlucoPhenol may improve insulin sensitivity and prevent an increase in compensatory insulin secretion, representing a promising approach to improving glucose management in subjects at risk for type 2 diabetes,” explained Jacques. “These results are particularly encouraging, as they indicate that polyphenols may delay or even halt the progression to type 2 diabetes.”

The findings suggest that the cranberry and strawberry polyphenols found in GlucoPhenol may increase both insulin signaling and the transport of glucose into skeletal muscle, thus improving insulin sensitivity. Larger and longer-term studies will be needed, along with controlled dose-response trials to determine the lower and upper range of activity of these polyphenols.

“This latest research represents another significant advancement resulting from our collaboration with INAF,” explained Barry Ritz, Chief Scientific Officer for Atrium Innovations. “We have already incorporated the learnings from this study into Atrium Innovations products, and are committed to continued research to fuel innovation that will improve health outcomes for patients.”

While berries such as strawberries and cranberries are often referred to as “superfoods” and have numerous health benefits, the bioavailability of bioactive polyphenols in whole foods have been shown to be relatively poor.^{3, 4} In the current study, however, the concentration of four active polyphenol compounds and metabolites from GlucoPhenol most likely responsible for the observed benefits were identified and measured in the blood of study participants. The GlucoPhenol used in the study consists

1. International Diabetes Federation. <http://www.idf.org/about-diabetes/facts-figures>

2. American Diabetes Association. (December 2016) <http://www.diabetes.org/diabetes-basics/statistics/>

3. Cardona F, Andr es-Lacueva C, Tulipani S et al, “Benefits of Polyphenols on Gut Microbiota and Implications in Human Health,” *J Nutr Biochem*

of a proprietary blend of cranberry and Orléans strawberry extracts from North American farms and developed specifically by the study partners. This specific blend of polyphenols is now available exclusively in three products under Atrium Innovations' Pure Encapsulations, Douglas Laboratories and Genestra brands.

This study is part of a multi-year research collaboration between INAF and Atrium Innovations, exploring the impact of lifestyle and nutritional interventions on cardiometabolic health. In addition to polyphenols, researchers have also explored clinical applications of fish oil and systemic enzymes and their role in improving cardiometabolic health outcomes.

STUDY METHODOLOGY:

The study included 41 healthy but insulin-resistant participants ranging in age from 40 to 70, each with a body mass index (BMI) > 25 kg/m², in a parallel, double-blind, controlled and randomized 6-week clinical trial. The consumption of berries, wine, polyphenol supplements and all products containing berries or wine was forbidden throughout the entire study period. Insulin sensitivity was assessed by the hyperinsulinemic-euglycemic clamp, and a 2-h oral glucose tolerance test was performed at the beginning and at the end of the experimental period. Results showed that GlucoPhenol increased insulin sensitivity (M/I) by 14% ($+0.9 \pm 0.5 \times 10^3 \text{ mg} \cdot \text{kg}^{-1} \cdot \text{min}^{-1} \cdot \text{pmol}^{-1}$) whereas control decreased insulin sensitivity (M/I) by 7% ($-0.5 \pm 0.5 \times 10^3 \text{ mg} \cdot \text{kg}^{-1} \cdot \text{min}^{-1} \cdot \text{pmol}^{-1}$), a 21% differential effect between groups. This improvement in insulin sensitivity was both statistically ($P = 0.03$) and clinically significant.

Atrium Innovations contributed the GlucoPhenol and control products used in this study. The study was supported by the Consortium de recherches et innovations en bioprocédés industriels du Québec (CRIBIQ), Atrium Innovations Inc., and Nutra Canada Inc. (now member of Diana Food Inc.)

For more information, view the full study here (<http://bit.ly/2oQXzBG>).

About the Institute of Nutrition and Functional Foods (INAF)

(<http://www.inaf.ulaval.ca/en/home/#.WNBUuxLytR1>)

INAF is a recognized network of renowned multidisciplinary scientists working together to advance knowledge about human nutrition and its impact on health. Over the past ten years, INAF has put together the largest team of Canadian researchers (80+) dedicated to understanding the complex relationships between foods, food components, nutrition and health, and the role they play in prevention of chronic diseases. INAF puts science at the service of nutrition to fulfill its mission and ensure its actions lead to concrete and durable results that benefit the population's health and the bio-food sector.

About Atrium Innovations

Atrium Innovations Inc. is a globally recognized leader in the development, manufacturing and commercialization of innovative, science-based, natural health products that are distributed in more than 35 countries. The company owns healthcare practitioner and specialized retail product brands that are at the forefront of science, innovation and education. Atrium has over 1,300 employees and operates seven manufacturing facilities, all of which comply with Current Good Manufacturing Practices. The family of Atrium Innovations brands includes Pure Encapsulations, Garden of Life, Wobenzym[®], Genestra Brands, Douglas Laboratories and Klean Athlete.

3. Cardona F, Andrés-Lacueva C, Tulipani S et al, "Benefits of Polyphenols on Gut Microbiota and Implications in Human Health," *J Nutr Biochem* 24 (2013), 1415–1422.

4. Zibera L, Fornazsaro S, Čvorović J et al, "Bioavailability of Flavonoids: The Role of Cell Membrane Transporters," in *Polyphenols in Human Health and Disease*, eds. Ronald Ross Watson, Victor R. Preedy, Sherma Zibadi (Academic Press: San Diego, 2013): 489–511.