

PROJECT SUMMARY

Instructions:

The summary is limited to 250 words. The names and affiliated organizations of all Project Directors/Principal Investigators (PD/PI) should be listed in addition to the title of the project. The summary should be a self-contained, specific description of the activity to be undertaken and should focus on: overall project goal(s) and supporting objectives; plans to accomplish project goal(s); and relevance of the project to the goals of the program. The importance of a concise, informative Project Summary cannot be overemphasized.

Title: Determining The Gut Microbiota-Dependent Impacts Of Anthocyanin-Rich Aronia Berries On Obese Individuals Of Distinct Inflammatory Phenotypes

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The overall goal of this project is to determine the inflammation lowering impact of anthocyanin-rich Aronia berries. Inflammation is an underlying mechanism driving the development of several diseases. While an elevation in immune signals in the systemic circulation is commonly attributed to adipose tissue, inflammation is not present in all obese individuals. Adipose tissue must become inflamed, and the inflammation trigger may come from other sources. Microorganisms (microbiome), host tissues, and immune cells residing in the gastrointestinal tract (GIT) are a key source of pro-inflammatory signals that may cause the host organism to become inflamed. Anthocyanins are bioactive compounds with established anti-inflammatory and microbiome altering properties. We hypothesize that the GIT microbiome is a key determinant of host inflammation than can be manipulated by anthocyanin-rich berries to lower inflammation. We have done preliminary work to differentiate low (Low-INF) and high (High-INF) inflammation phenotypes in humans so that we can investigate this hypothesis. Here, we will 1) assemble a cohort of Low-INF and High-INF individuals and characterize their GIT microbiome, 2) establish (humanize) the GIT microbiome of Low-INF and High-INF individuals in germ-free mice and determine whether inflammation phenotype transfers with the microbiome, and 3) submit the humanized mice to a high fat diet and test the effects of anthocyanin-rich Aronia berries on the GIT microbiome, inflammation, and health. With a greater understanding of the impact of Aronia berries on inflammation, we will be positioned to pursue larger, randomized, clinical trials to demonstrate the impact of Aronia berries on human health.

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