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## Research Summary for *Lactobacillus bulgaricus* G-LB-44

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Bacteria are the most common form of life on planet earth. The bacteria normally present in or on the human body outnumber the cells that make up our bodies by ten-fold and play an important role in keeping us healthy. These “good” bacteria provide nutrients for us, prevent pathogenic or “bad” bacteria from growing in or on our bodies, and help our immune system develop normally. Many of these “good” bacteria belong to a group called lactobacilli. The food that we eat, water we drink and even the air that we breathe all contain bacteria and are an important way to replenish the “good” bacteria living in and on our bodies. Most people are only aware of the bacteria that cause infections, while the bacteria that help us stay healthy are largely unknown to the general public.

It has been recognized for some time that certain “good” bacteria are active in suppressing the growth of other, more harmful bacteria. A great deal of scientific research has been directed at these helpful, or probiotic, bacteria. Probiotic bacteria have been included in a variety of foods that we eat, such as yogurt, to replenish the bacteria in our bodies and promote better health. In fact, the FDA requires that specific strains of “good” bacteria, such as *Lactobacillus bulgaricus*, must be present in order for fermented dairy products to be called yogurt. Recent scientific research has shown that probiotic activity tends to be specific to particular strains of bacteria that are often part of the group (genus) called *Lactobacillus*. We have evaluated the inhibitory effects of one probiotic strain, ***Lactobacillus delbrueckii* subsp. *bulgaricus* G-LB-44** in our laboratory using organic juice products. These products normally contain a variety of bacteria acquired during the growth and harvest of the ingredients, some of which can be harmful for human health. We tested whether the addition of this strain of probiotic bacteria could inhibit or kill potentially pathogenic organisms. In these studies we added the probiotic strain, ***Lactobacillus delbrueckii* subsp. *bulgaricus* G-LB-44**, to juice products that contained specific “bad” bacteria including those most commonly associated with food borne diseases such as *Listeria*, *E.coli*, *Salmonella* and *Shigella* that may be present in improperly prepared or cleaned food. The results showed that ***Lactobacillus delbrueckii* subsp. *bulgaricus* G-LB-44** could reduce the growth of potentially harmful bacteria that cause disease in humans. In most cases, the reduction in the numbers of “bad” bacteria was greater than 99%. The broad based activity of ***Lactobacillus delbrueckii* subsp. *bulgaricus* G-LB-44** is unusual among *Lactobacillus* species and suggests that there are unique cellular components that may account for this activity. The ability of one organism to inhibit the growth of another organism is due to protein substances called bacteriocins. Such compounds are common in nature but tend to be directed at very specific strains of other bacteria that compete for nutrients with the probiotic bacteria in a natural setting such as the gastrointestinal tract. It is therefore unusual to find a single strain of *Lactobacillus* that produces an

inhibitory effect for a broad array of harmful bacteria, since these bacteria would rarely be found at the same time within the same natural setting. We are continuing to evaluate the inhibitory properties of this strain, as well as testing the usefulness of adding ***Lactobacillus delbrueckii* subsp. *bulgaricus* G-LB-44** to certain food products. Since this sub-species of *Lactobacillus bulgaricus* has been safely used in foods for over 100 years with no indications of overdose or side effects, we believe that if it is added to unpasteurized juice it will serve both as natural preservative capable of inhibiting “bad” bacteria and as a way to replenish the healthy bacteria found in our bodies.

Sincerely,

A handwritten signature in black ink, reading "Andrew Onderdonk". The signature is written in a cursive, flowing style with a large, prominent 'A' and 'O'.

Andrew B. Onderdonk