The impact of an anti-inflammatory probiotic supplementation on cognitive functioning in the elderly population – the moderating role of the dietary pattern.

In this project we want to check how different diet styles influence cognitive functioning of the elderly people and whether it is possible to counteract the negative influence of a particular diet by supplementation with a special kind of bacterium. We assume that some dietary patterns (e.g. so called Western Diet, where one consumes a lot of sugar and fat in a form of fast foods) cause neuroinflammation, especially visible in a part of the brain responsible for memory. We propose that a dietary intervention with an anti-inflammatory probiotic bacterium (*Lactobacillus plantarum O20*) will be able to mitigate this negative impact of proinflammatory diet. This is especially important to explore new ways of preserving cognition as our societies face growing numbers of elderly and obese members. On a top of questions about diet influence on cognition and possibility of beneficial intervention with probiotics, we also want to check whether the initial status of the subject's gut microbiota can have the impact on the bacterial intervention efficacy?
We plan to conduct a two-phase study on a large sample of adults age 55 and above (to the second phase we will invite people over 60). **We want to check if supplementation with anti-inflammatory probiotics can modify the negative impact of the pro-inflammatory diet pattern, on cognition**. We will investigate this relationship on two levels: behavioral with two known paradigms measuring long term (so called episodic) memory and short term memory. We will also study landmark psychophysiological correlates of this processes.

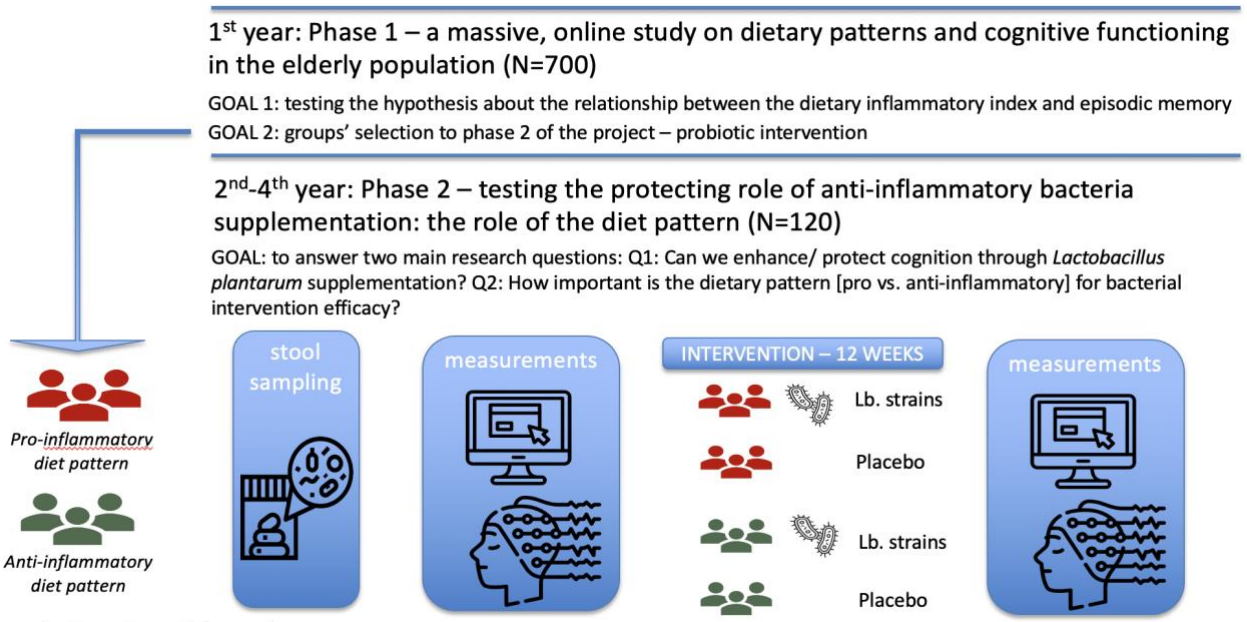

Figure 1. Overview of the project.
Icons: www.flaticon.com

We have previously shown (Bramorska et al., 2021) that the frequency of consuming different types of foods (healthy versus unhealthy dietary patterns) may be a protective or worsening factor in the age-related cognitive decline. In the study proposed here we want to further investigate the relationship between different food consumption (with a special emphasis of diet's pro- or anti-inflammatory potential) and cognitive functioning in older age. Additionally, we want to verify the possibility of counter interact the negative impact of unhealthy (pro-inflammatory) diet patterns by supplementing our participants with a specially selected strain of bacterium with an anti-inflammatory potential.

Literature:

Bramorska, A., Zarzycka, W., Podolecka, W., Kuc, K., & Brzezicka, A. (2021). Age-Related Cognitive Decline May Be Moderated by Frequency of Specific Food Products Consumption. Nutrients, 13(8). https://doi.org/10.3390/nu13082504