The effect of anthocyanins and elagotanins on the mechanisms associated with development of non-alcoholic fatty liver.

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Poland is a one of global leaders in the production of raspberries. These fruits are known as a rich source of dietary antioxidants largely due to their high level of phenolic compounds, which are primarily comprised of anthocyanins, ellagitannins, phenolic acids, and conjugates of ellagic acid. In addition to their strong antioxidant properties, raspberry polyphenols have also shown other beneficial bioactivities including anti-inflammation, antimicrobial activity against pathogenic intestinal bacteria, and anti-proliferation of human cancer cells. Nevertheless health-promoting potential of the raspberry polyphenols is still not sufficient explored.

Our preliminary *in vitro* study on hepatocytes presented that native polyphenols from raspberry may also regulates immune-metabolic signals associated with development of nonalcoholic fatty liver disease (NAFLD). This liver disorder has become the most common liver pathological state worldwide affecting an estimated 15-30% of most populations. Actually most of the studies are focused on direct hepatoprotective effects of the resveratrol, curcumin and quercetin. The available literature about nutritional experiments with polyphenols from raspberries and their influence on the development of liver-related disorders is limited. Moreover, there is lack of information about broader polyphenolic effects combining regulation of the signals from gastrointestinal tract and liver. Therefore the aim of the project is to investigate effect of diet enriched with polyphenolic preparation from raspberry on microbiota activity in the gastrointestinal tract and systemic parameters involved in the regulation of metabolic liver-related disorders.

The experiments will be performed on Wistar and Zucker rats, used as well-recognized experimental model for precise assessment of the body's response. The scope of research methods will include: molecular biology techniques (e.g., RT-qPCR, new generation sequencing NGS, ELISA), analytical chemistry using UHPLC, histological techniques and *in vitro* using hepatocyte and macrophage cell lines.