

A growing evidence suggests that proper functioning of human organism depends on a mutualistic relationship with gut bacteria which produce a number of biologically active compounds entering the blood. Among a number of compounds, mammalian gut flora produces gases including hydrogen sulfide (H<sub>2</sub>S) and methane. Recently it has been found that disturbances in gut flora are associated with high blood pressure (hypertension) in both animals and humans.

Our hypothesis states that H<sub>2</sub>S and methane produced by gut bacteria affect the regulation of arterial blood pressure and may be involved in the development of hypertension.

In our study we will check the effects of increased concentration of H<sub>2</sub>S and methane in the large intestine on arterial blood pressure. We will also develop new compounds releasing H<sub>2</sub>S which will be tested as antihypertensive drugs. The studies will be performed in rats.

We believe that our study will clarify the role of gut-derived bacteria metabolites such as H<sub>2</sub>S and methane in the regulation of arterial blood pressure and in the development of hypertension. The study will be important for assessing therapeutic potential of drugs affecting production of H<sub>2</sub>S and methane in the guts. This is important as hypertension is one of the leading causes of mortality and morbidity in the European Union.