Rhubarbs (the genus *Rheum* L.) are usually identified as foods. However, it should be noted that these plants have a long history of ethnomedicinal uses in different cultures of the World. Some species are also present in contemporary alternative medicine, especially as natural remedies for gastrointestinal disorders or menopause-related complaints. On the other hand, despite many applications of rhubarb in herbal medicine, biological activity and physiological effects of these plant are only partly recognized. The best known is phytoestrogenic action of extracts from roots of *Rheum rhaponitcum* (rhapontic rhubarb), while other activities of both this rhubarb and other species are described in a significantly lesser extent. One of poorly recognized aspects of biological activity of different rhubarb species is their influence on physiology of the cardiovascular system, especially in a context of cardioprotective potential.

Thus, the presented project has been designed in order to investigate biological activities of extracts from rhubarb species in experimental systems related to physiology of blood vessels and blood components. It includes analyses of extracts obtained from four rhubarb species, i.e. *R. rhaponticum* (rhapontic rhubarb), *R. rhabarbarum* (garden rhubarb), *R. palmatum* and *R. oficinale*. The examined species were chosen based on their use for culinary purposes and presence in herbal medicine as well as literature data on bioactive substances. The extracts will be isolated from edible plant petioles (leaf stalks) as well as from underground parts of the plant (i.e. rhizomes and roots), which are used for medicinal purposes.

The proposal is constructed from five main tasks covering phytochemical analyses as well as *in vitro* and *in silico* studies on different aspect of biological properties of the examined plants, including issues that are crucial for cardioprotective effects of plant-derived substances. The examined rhubarb extracts will be isolated, phytochemically analysed and standardized at the Institute of Soil Science and Plant Cultivation – State Research Institute in Puławy (the partner in this project), while their biological properties will be studied at the University of Łódź (the leader of this project).

Studies on biological action of the extracts will be based on execution of the following analyses of:

I) anti-inflammatory effects of the extracts (assessment of inhibitory action on key pro-inflammatory enzymes, inflammatory response of the peripheral blood mononuclear cells and endothelial cells),

II) effects of the extracts on haemostasis – i.e. studies of haemostatic properties of blood plasma and endothelial cells, in order to assess the anti-thrombotic potential of the examined extracts,

III) antioxidative properties of the examined extracts – evaluation of protective effect on the oxidative stress induced damage to proteins and lipids in blood plasma,

IV) cytotoxicity of the examined extracts towards blood and endothelial cells - in order to assess the safety of using the extracts.

A multi-aspect construction of the project will enable comparative evaluation of biological activities and potential cardioprotective actions of the examined extracts from various rhubarb species and selection of the most active extracts.