

Mentor

Assist. Prof. Zala Jenko Pražnikar, Ph. D.

Research field

The research field extends from medicine (hormonal and metabolic disorders) to biochemistry. Zala Jenko Pražnikar studies metabolism in association with metabolic syndrome and obesity and other chronic non-communicable diseases. It studies low grade systemic inflammation, that leads to metabolic complications, insulin resistance, metabolic syndrome (MetS), type 2 diabetes mellitus (T2DM) and cardiovascular diseases (CVD). The pathophysiological mechanisms underlying the development of obesity-induced CVD are still poorly understood. However, it seems that progressively impaired metabolic states until and comprised MetS are reversible, which makes biomarkers that would identify subjects at risk, very important. Many classical markers of metabolic complications, such as fasting glucose, high blood pressure, dyslipidaemia, are markers of already present disease or not sensitive enough and thus excluding certain subpopulations of patients. Zala Jenko Pražnikar searches for biomarkers to identify individuals at a higher risk for developing chronic non-communicable diseases.

In addition, Zala Jenko Pražnikar searches also for new sources of natural bioactive compounds/extracts of specific Mediterranean plants, which are a rich source of many phytochemical compounds and have several biological properties; including antimicrobial, anti-inflammatory, antioxidant, antiviral, anti-inflammatory and other. In response to proclaimed EU strategies focused on the production of added value food products, Zala Jenko Pražnikar, through interdisciplinary projects, is also involved in the designing and biological testing of new food products with bioactive compounds and potentially favourably impact on metabolic profile.

Relevant References:

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Faculty member of UP and the research programme

The Research program P1-0386 entitled “Conservation biology, from molecules to ecosystem” is organized into three work packages: 1) Conservation ecology 2) Conservation genetics and 3) Healthy Mediterranean ecosystem. The UP Faculty of Health Sciences is included under the Healthy Mediterranean ecosystem, where the research is focused primarily on multidisciplinary studies of health benefits of the Mediterranean diet. The increasing demand for natural antioxidants, together with the introduction of new technologies to meet the new quality standards, justifies the search for new sources of natural bioactive compounds. The Mediterranean Basin is a biodiversity hotspot, contributing about 10% of the world’s plants. Heterogeneous environmental conditions and complex historical processes contributed to the development of global refuge for relict plants and their speciation. Mediterranean plants are a rich source of phytochemicals and bioactive molecules important for human health. These molecules are synthesized during the plant response to different ecological factors present in the complex Mediterranean ecosystem. Secondary metabolites are known to play a major role in the adaptation of plants to their environment and they are often differentially distributed among limited taxonomic groups within the plant kingdom. Aromatic plants play an important role in discovery and development of new drugs, cosmetics and natural food supplements. The interest of natural phytochemicals in relation to their therapeutic and health beneficial properties has been increasing in the recent years. As part of the P1-0386 program, the Faculty of Health Sciences is involved mainly in the analysis of the effectiveness of specific Mediterranean plants, which represent a rich reservoir of numeral phytochemicals possessing several

biological properties, including antimicrobial, antiinflammatory, antioxidant, anti-viral, anticarcinogenic, antilarvicidal and others.

Other information about the mentor

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A brief description of the future young researcher training

The framework of the training programme:

A young researcher will study the effects of selected bioactive compounds/extracts of Mediterranean plants on human health. Aromatic plants play an important role in discovery and development of new drugs, cosmetics and natural food supplements. The interest of natural phytochemicals in relation to their therapeutic and health beneficial properties has been increasing in the recent years. Therefore, antioxidative, antimicrobial, anticarcinogenic and antiinflammatory effects of the obtained extracts/distillates or bioactive compounds will be carefully tested in order to link the established beneficial health effects with the isolated natural compounds from the corresponding plant. The selected extracts will be used also to test the prevention of the biofilm formation, to test adhesiveness and invasiveness of certain bacteria etc.

Finally, clinical studies will be conducted included plant extracts with proven beneficial effects *in vitro* in the daily diet. Blood and urine samples will be taken for the biochemical analysis, and faecal samples for microbiota analysis.

List of research programmes and projects:

- P1-0386 (National program) - Conservation biology, from molecules to ecosystem
- J3-8209 (National project) Bilirubin as a protective factor against development of chronic degenerative diseases: serum biomarker and possibilities of pharmacological modulation
- European Food Safety Authority (EFSA) project (EU MENU)

Preferable area of study for the young researcher

The preferred fields of study are biology, microbiology, biochemistry, biotechnology, but also related sciences.

Other useful skills and competences for the position:

English language, ability to work in a team, communicativeness

Useful links

<http://www.fvz.upr.si/>