

Menopause is experienced by all women who complete an expected life span. It occurs naturally, at an average age of 52 years, as a consequence of ovarian failure and succeeding loss of estrogen. As expected female life span increases and the population in developed countries ages, even greater numbers of women enters menopause and lots of them spend more the one third of their lives in the postmenopausal phase suffering from symptoms and complications of menopause. **Among symptoms of estrogen deficiency, postmenopausal osteoporosis and “hot flashes” come to the fore, because of their high incidence and their negative impact on the quality of life.**

The aim of the proposed scientific project is investigation of the influence of prenylflavonoids from hops extract (*Humulus lupulus L*) on development of postmenopausal osteoporosis and perimenopausal „hot flashes”. At the same time we plan to examine chronic toxicity of administrated substances and long therapy on their pharmacokinetics.

To verify the hypothesis, suggesting beneficial influence of hops extract on bone metabolism and ameliorating effect on menopausal symptoms, we have planned series of animal experiments to investigate the influence of hops extract fractions on bone microarchitecture, bone mineral density and bone biomechanical properties in ovariectomized rats. During proposed experiments will also examine the influence of investigated extracts on rat tail skin temperature .

To investigate influence of hops extract and xanthohumol on osteoporosis development we will monitor during animal experiments bone mineral density (BMD) using dual-energy x-ray absorptiometry (DXA) and concentrations of bone turnover markers. After termination of the animal experiment we plan to examine bone biomechanical properties and bone histomorphometry.

Assessment of influence of bioactive components of hops extract on hypogonadism-induced “hot flashes” will be based on analysis of influence of hops extract on rat tail skin temperature measured using telemetric methods.

To investigate safety of chronic therapy with hops extract histologic examination of critical organs will be performed. To assess the influence of chronic administration of hops extracts on pharmacokinetics of prenylflavonoids, blood samples and tissues will be collected for pharmacokinetic tests.

It is extremely significant to look for new components that on one hand characterize with excellent safety profile, but on the other hand protect against postmenopausal osteoporosis blocking increased bone resorption induced with estrogen-deficiency. At the same time it is equally important to answer the question in hops prenylflavonoids may ameliorate perimenopausal “hot flashes”. If the hypothesis about beneficial influence of hops prenylflavonoids on “hot flashes” and osteoporosis development will be confirmed, the results of proposed project become starting point for further research aiming at development of drugs used to ameliorate menopausal symptoms. In addition it is worth to mention, that examined hops extract will be obtain from supercritical carbon dioxide extracted hops, that are scrap material of brewing industry, so the proposed project may help to find the new way of making use of this scrap material.