

## BERRIES AS A NATURAL SOURCE OF BONE SUPPORT: THE INVOLVEMENT OF ANTHOCYANINS IN THE MOLECULAR MECHANISMS OF THE HEALING AND REGENERATION PROCESSES

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Bone tissue has a remarkable self-regenerating ability which, in case of injury, enables return to a completely functional, pre-injury state. However, ageing, disease, obesity, traumas, multiple fractures, infections and tumor removal cause large bone defects that cannot be healed spontaneously. To achieve successful bone healing and regeneration, plenty of approaches, including the application of autografts, allografts and bone tissue engineering (BTE), have been developed. One of the approaches is based on the findings that bone loss in humans and many animals during aging is partially caused by accumulation of reactive oxygen species (ROS). Due to the spectrum of biological activities, including antioxidative, essential polyphenolic components—anthocyanins (ACNs), are a part of a significant research area regarding means and methods for bone healing and regeneration. Berries are especially rich in ACNs. Based on *in vitro* and *in vivo* studies regarding molecular mechanisms involved in bone healing and regeneration supported with berries' ACNs and on observational research in human populations, it has been found that berries' ACNs enhance osteoblastogenesis, suppress osteoclastogenesis and have osteoimmunological activity. Therefore, berries' ACNs should be considered as naturally widespread therapeutics for bone support. Nevertheless, before implementation of berries as a natural source of bone support, there are some issues left to resolve: clarification of molecular mechanisms of ACNs action in bone metabolism, identification of effective doses of particular ACNs for bone regeneration therapies and performing clinical studies for determination of therapeutic efficacy of different types and concentrations of ACNs.

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