

## The scope of flavonoids in diseases of the central nervous system

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One of the fastest growing fields in medical research is the one that concentrates on the effects of harmful free radicals. Their implications are widely analysed in the course of inflammatory conditions, arteriosclerosis, neurodegenerative diseases (e.g. Alzheimer disease), ischemic-re-perfusion tissue damage, malignant diseases, etc. Also, there is a great deal of detailed research in the physiological processes related to aging being conducted.

Free radicals are molecules or molecule fragments that contain a free electron that is responsible for the high reactivity to the molecule. Free radicals occur frequently in the environment and in living organisms during physiologic processes, their occurrence is promoted by UV, radioactivity, microwave radiation, tobacco smoke, industrial solvents and chemicals, among other factors. They get into our bodies with food (the best known oxidative process is the one that makes oils or butter to turn rancid), inhalation or through the skin.

Our system is able to eliminate the majority of these free radicals. The protective mechanisms are interconnected systems of enzymatic and non-enzymatic elements. Some of them (e.g. **flavonides** that are synthesized only in plants; vitamins) can only be obtained from external sources, with food or dietary supplements.

We call *antioxidants* the molecules that are present in small quantities compared to the substrate that is to be oxidated, and they are able to significantly slow down or even completely block the oxidation. In the related scientific literature a number of research papers arrived to the conclusion that the *combined application of dietary antioxidants is more effective than the separated, isolated use*.

**The flavonides are antioxidants from natural sources, also known as free radical scavengers.** Their therapeutic effects has been proven in clinical studies. Their **preventative and/or supportive efficacy** has been described in several clinical pathologies. We know a number of diseases in neuropsychiatry, where the role of free radicals in the pathology and the therapeutic use of antioxidants is taken into consideration. As examples, Alzheimer disease or the physiological aging process, and there are some connections with Parkinson's disease. In case of Alzheimer disease, the role of metallic ions,  $\beta$ A-deposition, increased MAO-B levels are suspected in the background of increased free radical formation, although, the mechanism is not identified yet. Flavonoids, thanks to their neuroprotective effects, might play a role in the rehabilitation process after cerebrovascular stroke.

Flavonoids show neuroprotective effects, that may result in protection against neurodegenerative processes that are suspected to be facilitated by long standing depression. Among other effects, it was found that there is a significant protective effect of flavonoids on the area of hippocampus. This area of the brain is related to the learning processes, memory functions; injuries of this area result in mental retardation, dementia.

The **Flavin7** is a unic, registered fruit concentrate that is independently developed in Hungary, marketed as a dietary supplement. During the development process, the product became the basis for a group of products. We have proved the high free radical scavenger effects of this product of broad spectrum flavonoid components in animal experiments and also in human research.

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