

The aim of this study was to verify the validity of Harman's free radical theory of aging using new models of aging in plants and yeast, as these organisms have recently been accepted by the international scientific community as recognized models for studying the mechanisms of aging at the molecular level.

Given that endogenous production of free radicals plays a central role in Harman's theory of aging, my study focused on monitoring the temporal development of their end products. In parallel, I also monitored changes in antioxidant systems, which determine the extent of damage caused by free radicals.

Recently, it has become evident that reactive nitrogen species also participate in the aging process, and therefore I directed my attention to mechanisms involving these compounds as well.

As model organisms, I used common bean (*Phaseolus vulgaris* L.), transgenic tobacco plants (*Nicotiana tabacum* L.) with altered cytokinin concentrations, thale cress (*Arabidopsis thaliana*), and yeast (*Saccharomyces cerevisiae*).