ABSTRACT

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The process of biological aging is connected with a loss of tissue function leading to the various pathologies, including cardiovascular diseases and cancer. Cellular senescence, the phenomenon characterized by permanent cell cycle arrest triggered by endogenous or exogenous stress plays a significant role in age-related metabolic diseases development. Senescent endothelial cells have been found in atherosclerotic plaque and due to the inflammation-inducing factors participate to its progression. Nevertheless, by triggering antiproliferative reaction, senescence may also have a potential as a cancer suppressor. The aim of this work was to establish assay determining senescence with different origins and subsequently, to analyse compounds with a potential to reduce H_2O_2-induced senescence as well as factors, which may be altered in the senescent phenotype. Senescence-associated β-galactosidase (SA-β-gal) assay in primary human endothelial cells revealed the senescence-inhibiting ability of statins and curcumin in contrast to xanthohumol and curcumin metabolites - ferulic acid and feruoylacetone. SA-β-gal assay also displayed elevated positive-stained cells in doxorubicin-resistant liver cancer cells.

Taken together, our results present a promising role of statins and curcumin in cellular senescence inhibition and therapy-induced senescence as an interesting target for further cancer therapy research.