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Melatonin treatment improves aging-related conditions in the liver of Apo E-KO mice

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Aging is a complex, dynamic, and multifaceted process that is currently still poorly understood [1]. Hypercholesterolemia increases and exacerbates stress signals contributing to aging-related disorders in different organs such as liver [2]. Aging may contribute to the loss of cells in vital structures or organs through several mechanisms. Sirtuin1 (SIRT1) is a member of the sirtuin family of protein deacetylases involved in life span extension; however, its involvement in the aging is not yet completely defined. Recently, it was shown that melatonin, a pleiotropic molecule, activates SIRT1 and modulates oxidative stress-induced senescence and pro-survival pathways [3].

We treated 6- and 15-week-old apolipoprotein E-deficient mice (ApoE -/-) with melatonin to evaluate its anti-aging effects. Morphological changes and expression of SIRT1, inducible nitric oxide synthase (iNOS) and antioxidant enzymes (SOD, CAT) were evaluated in the liver of these mice.

We observed that SIRT1 expression and antioxidants enzyme activities were decreased in the liver of ApoE deficient mice between 6 and 15 weeks. On the other hand, hypercholesterolemia induced an elevated expression of iNOS in the liver of ApoE -/- animals. The treatment with melatonin improves the morphological impairment of the liver, reduced the oxidative stress and inhibited liver aging processes most likely via SIRT1 regulation.

References

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