

POSTER CERTIFICATE

We herewith confirm the presentation of the Abstract

Abstract Area: Ageing biology

Title: AED Peptide Activates Synthesis of Sirtuins in Human Skin Fibroblasts during Replicative Aging

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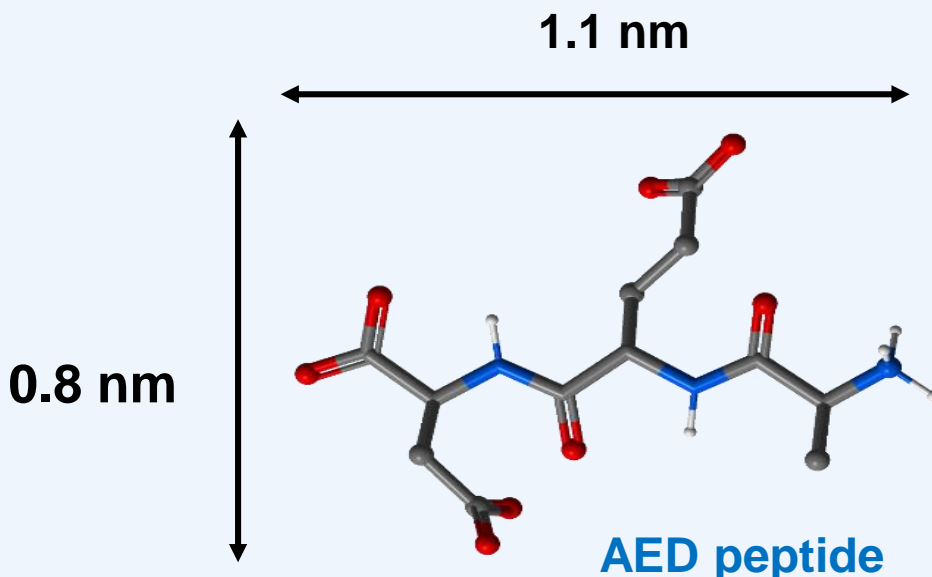
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AED PEPTIDE ACTIVATES SYNTHESIS OF SIRTUINS IN HUMAN SKIN FIBROBLASTS DURING REPLICATIVE AGING

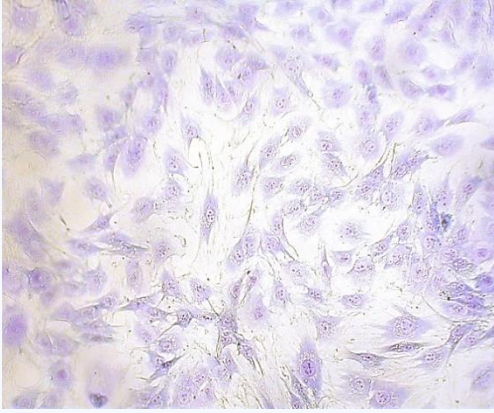
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Introduction. The AED peptide, isolated from the cartilage polypeptide complex, regulates fibroblasts metabolism. The aim of work is to study the effect of the AED peptide on the synthesis of sirtuin-1 and sirtuin-6 in human skin fibroblasts during aging. Sirtuins (SIRT) regulate cell cycle, apoptosis, inhibits cell ageing.



Methods



Female skin fibroblasts



**Fibroblasts were cultured up to the 3rd passage ("young" cultures) and the 14th passage ("old" cultures)
- replicative aging model**

AED peptide



Fibroblasts were divided into 2 groups: control and cultures with AED peptide (20 ng/ml)



Morphometry analysis. The area of Sirtuin's expression was determined as the ratio of the area occupied by immunopositive cells to the total area of cells in the field of view and was estimated in %.

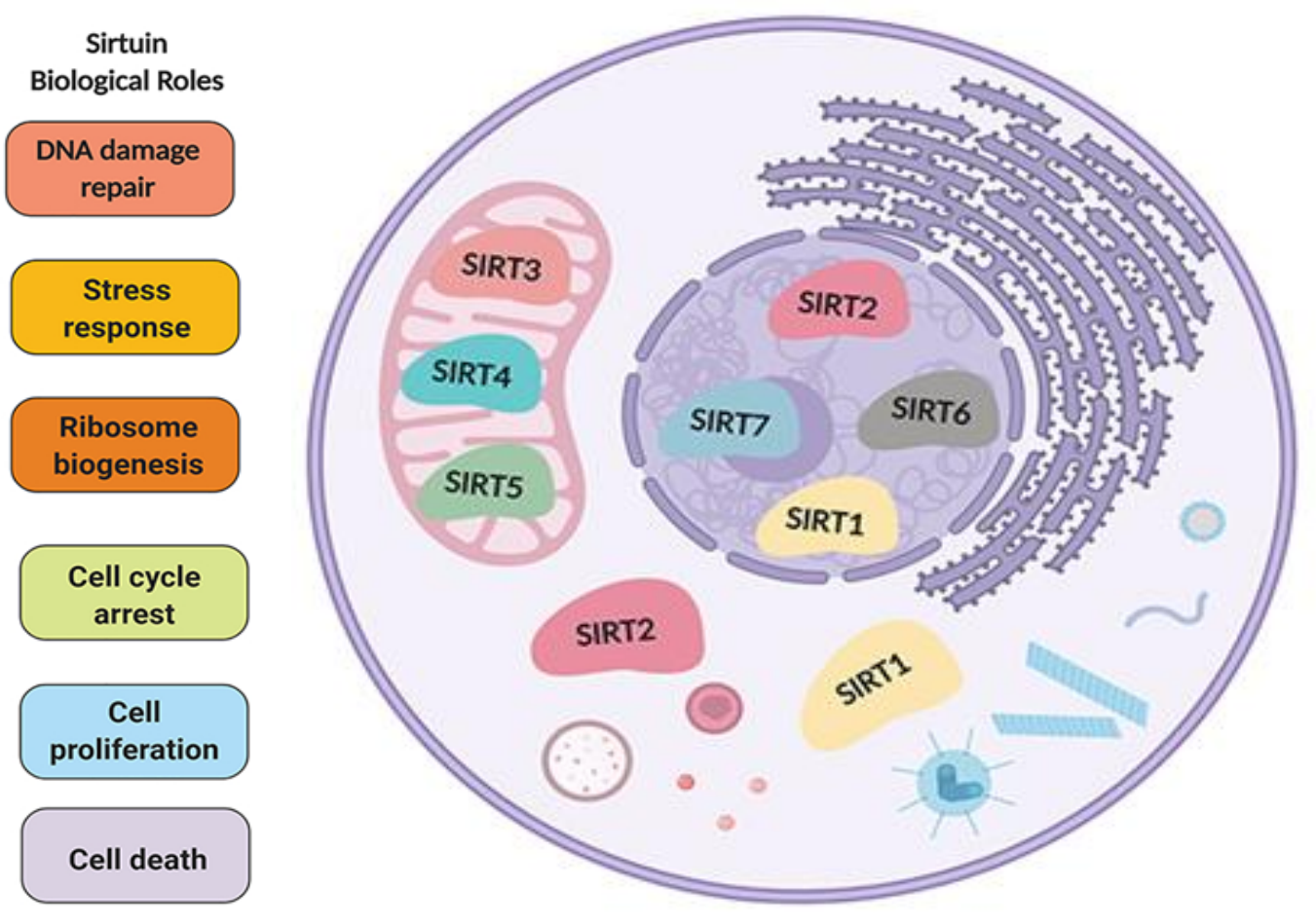


An immunocytochemical staining with antibodies to **SIRT-1 and **SIRT-6** was carried out. Micrographs of cells were obtained using a confocal microscope.**

Sirtuins - a family of NAD-dependent proteins which regulate transcription and cellular senescence by deacetylation of histone and non-histone target proteins.

SIRT-1 and **SIRT-6** slow down the replicative aging of cells and help to increase life expectancy. These proteins are involved in the DNA repair, inhibit pathological signaling cascades associated with inflamm-aging and antioxidant system dysfunction .

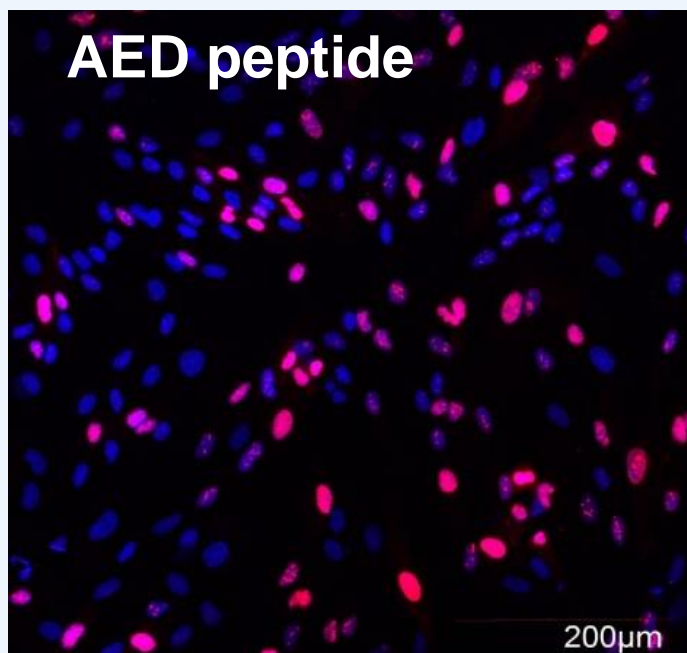
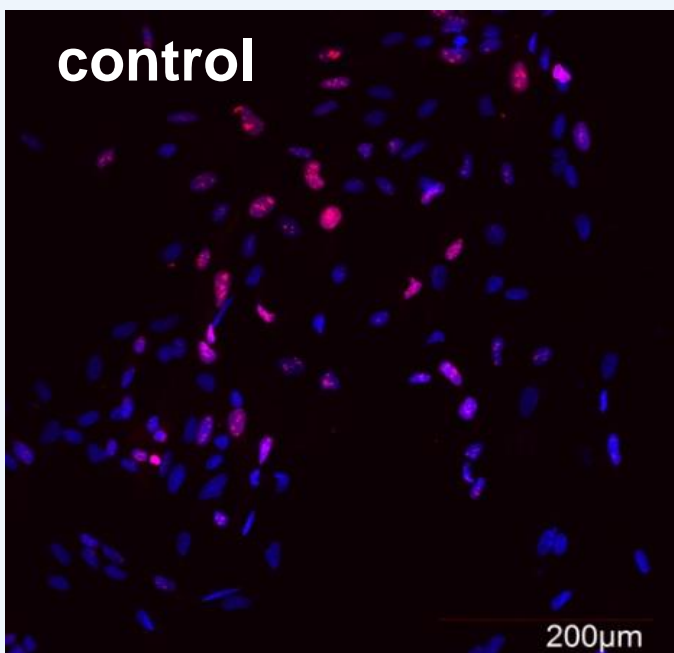
SIRT-1 can activate PGC-1 α and HIF-1 α transcription factors , the synthesis of which correlates with lifespan. SIRT1 reduces the activity of NF κ B, COX-2 and iNOS production, providing an anti-inflammatory effect.



Garcia-Peterson L.M., Guzmán-Pérez G., Krier C.R. et al. The sirtuin 6: An overture in skin cancer. *Exp. Dermatol.* 2020.

Results

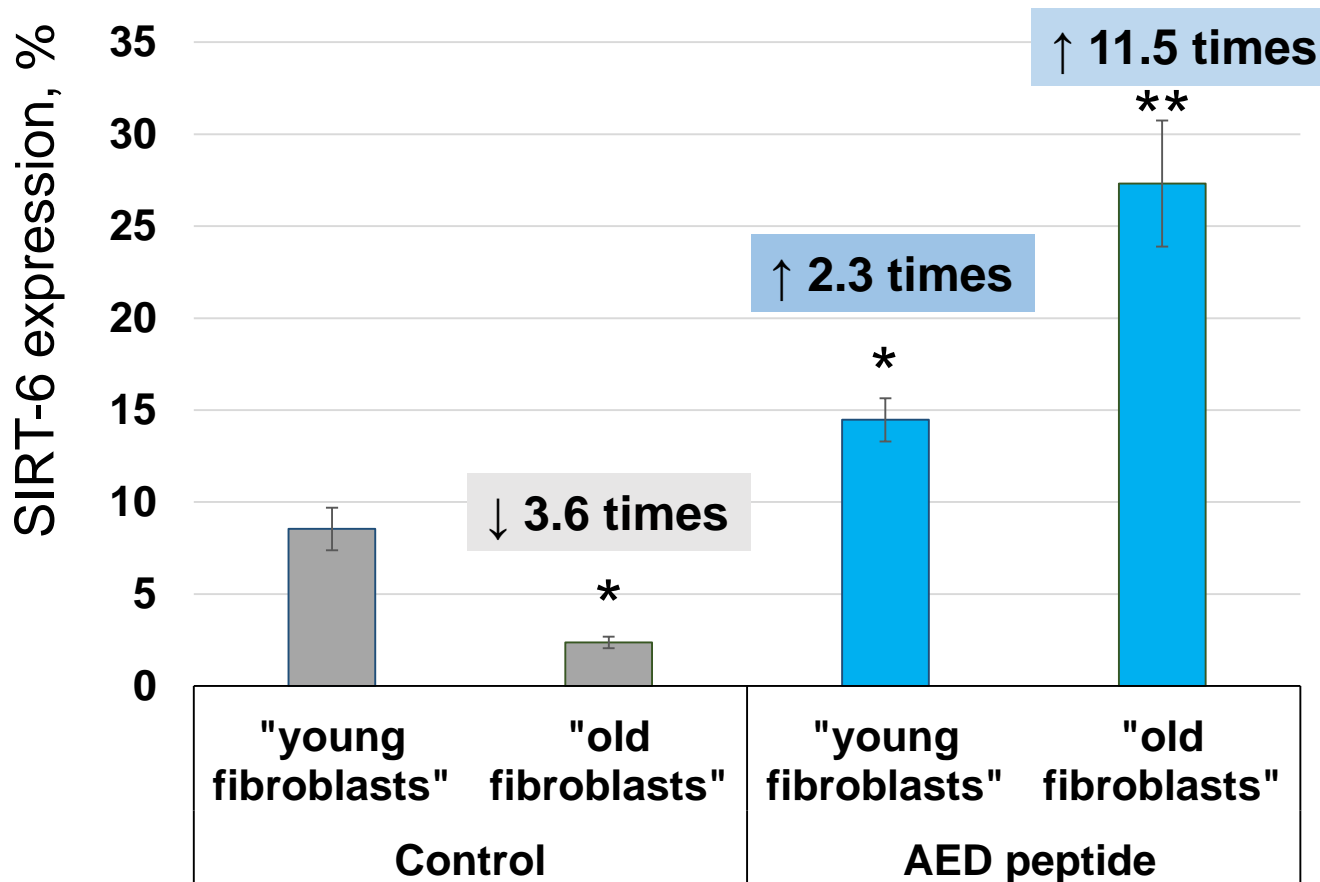
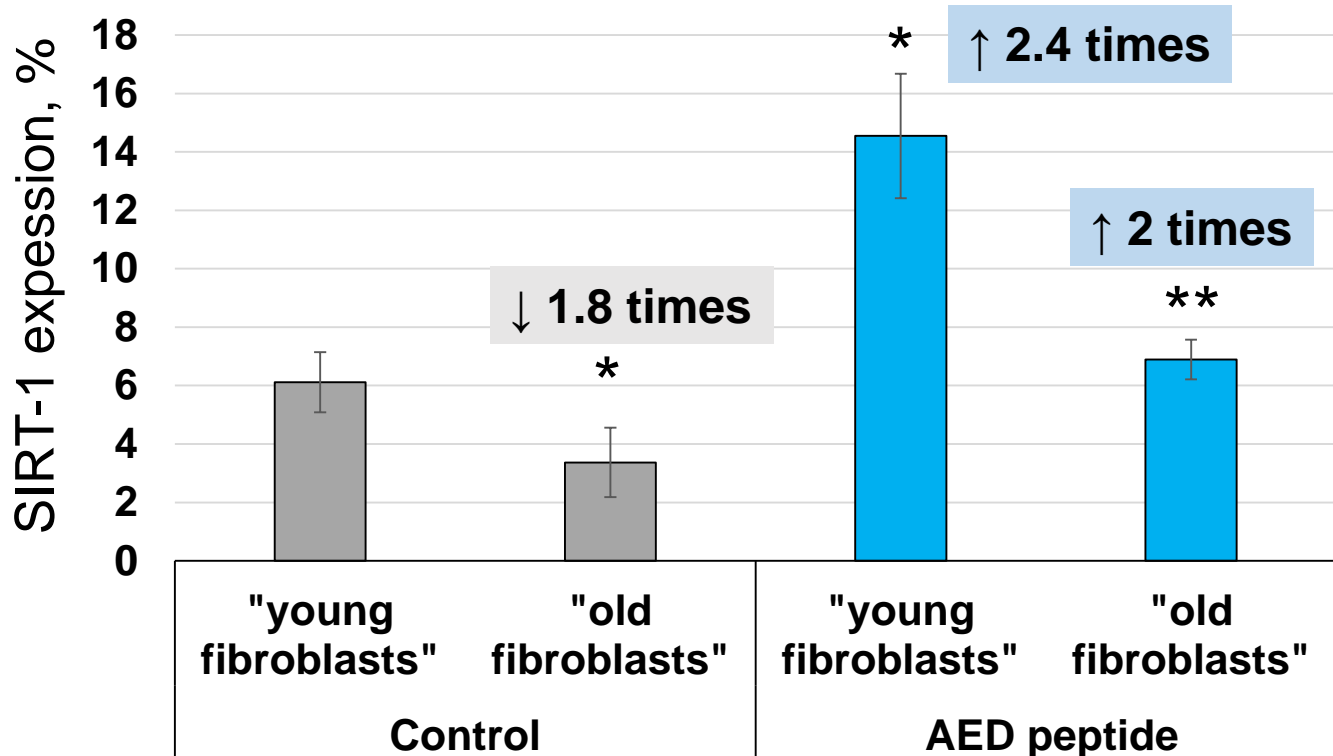
- ❖ The expression of SIRT-1 and SIRT-6 in "old" fibroblasts was 1.8 and 3.6 times lower, respectively, compared to "young" cells.
- ❖ The synthesis of SIRT-1 and SIRT-6 in skin fibroblasts decreases during replicative ageing.
- ❖ The AED peptide increases the expression of SIRT-1 and SIRT-6 in "old" cultures by 2.0 and 11.5 times, respectively, compared to the control. With the addition of the AED peptide, the expression of SIRT-1 and SIRT-6 in "young" fibroblasts increased by 2.4 and 2.3 times, respectively, compared to the control.



Immunofluorescence intensity of Sirt6 in human skin fibroblasts, 14th passage, 200x.

Immunofluorescence staining with antibodies to SIRT-6 (Alexa Fluor 647—pink fluorescence). Nuclei were counterstained with Hoechst 33258 (blue fluorescence).

AED peptide activated sirtuin expression in human skin fibroblasts during replicative ageing



* - $p < 0.05$ compared to the control "young fibroblasts"

** - $p < 0.05$ compared to the control "old fibroblasts"

Conclusion. AED peptide inhibits the development of age-related skin changes by activating the synthesis of SIRT-1 and SIRT-6, thus contributing to the normalization of the fibroblast function.