



Novel treatment or prevention of age-related diseases extending lifespan

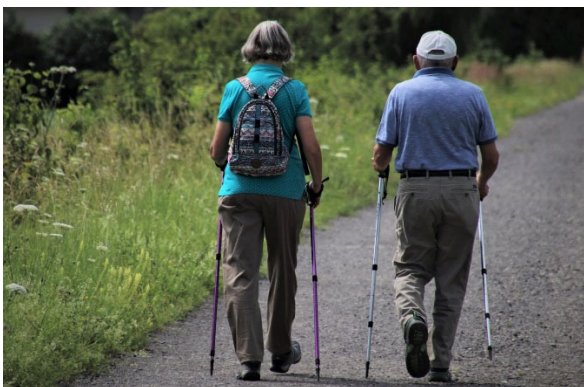
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INVENTION NOVELTY

The invention relates to the combination of the nicotinamide adenine dinucleotide (NAD) precursor nicotinamide ribosid (NR) with a calorie restriction diet (CRD) or a calorie restriction mimetic (CRM) to treat or prevent an age-related medical condition and prevent or slow down aging.

VALUE PROPOSITION

In old age there is a decrease of cell function and organ preservation. Today CRD is the best proven intervention to increase health and lifespan across different species by inhibiting the age-related loss of stem cell function. However, CRD loses its efficacy when applied at an advanced age, most probably due to a loss of mitochondrial function because CRD-mediated induction of mitochondrial activity is coupled with the activation of metabolic stress responses and increases stem cell function in young/middle aged mice, but this cascade of events cannot be activated in old age. Therefore, improved or alternative means for enabling the beneficial effects of CRD and CRM on lifespan and age-related decreases in cell and organ function in old or aging individuals are needed.



Combination of NR with CRD or CRM improves the health and fitness in the elderly.

TECHNOLOGY DESCRIPTION

NR is a form of vitamin B3 being converted into the essential co-factors NAD and NADH that are needed for enzymes that are involved in mitochondrial metabolism and metabolic stress response in the body. The inventors demonstrated that administration of NR reactivates positive effects of CRD on activation of mitochondrial function and stress responses. The combined application of CRD with supplementation of NR enhances the functionality of stem cells in old mice and extends survival compared to control mice. Furthermore, a combination of NR with pharmaceutical CRM (e.g. rapamycin, metformin) may also increase the efficacy of CRM and its positive effects on health in the elderly.

COMMERCIAL OPPORTUNITY

The technology addresses the field of dietary supplements for people of advanced age to improve health, physical activity and lifespan, and is offered for co-development or in-licensing.

DEVELOPMENT STATUS

The data were obtained in hematopoietic stem and progenitor cells and in vivo in mice.

PATENT SITUATION

A European priority application was filed in December, 2019 (EP19218069.3).

FURTHER READING

Chen et al. (submitted). Mitochondrial dysfunction abrogates metabolic and functional plasticity of aging hematopoietic stem and progenitor cells.

