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Effects of EnduBerry™ Nu on Presenilin 2 and FOXP1 Gene Expression

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INTRODUCTION

In this study, the effect of EnduBerry™ Nu on the expression of genes related mitochondrial function and cell protection (FOXP1, Presenilin 2) was investigated in aged human dermal fibroblasts isolated and compared to the corresponding untreated cells. FOXP1 is associated with increased proliferation in cardiomyocytes (1) and has been shown to suppress vascular inflammation (2). Further expression of FOXP1 has been shown to decrease with age in mesenchymel stem cells. It is thought that by controlling cellular senescence, FOXP1 can influence tendon and skeletal aging (3, 4). Therefore, increased FOXP1 may indicate a positive effect on cell fitness during aging. Presenilin 2 is a protease involved in the control of mitochondrial function. Dysfunction of presenilin 2 is associated disrupted mitochondrial bioenergetics and cellular oxidative stress (5, 6).

STUDY DESIGN

Cell cultivation and treatment

Normal human dermal fibroblasts (NHDF) were isolated from old donors. Prior to experimental start, the cells were grown for 24 hours in culture medium (DMEM + 10 % serum) and for another 24 hours in assay medium (DMEM + 1 % serum). Then the cells were treated with or without (control) 0.1 % EnduBerry™ Nu for 24 hours. After exposure, cells were harvested in phosphate buffered saline (PBS) and frozen at -80 °C. All conditions were performed in n=4.

Gene expression analysis

Replicates were pooled (yielding a final n=2) and total RNA extracted from each condition using TriPure™ Isolation Reagent (Roche) according to the supplier's instructions. The cDNA was synthesized by reverse transcription (RT) using a standard RT kit with oligo(dT) primers (Roche). Finally, the samples were amplified by quantitive real-time PCR using the LightCycler system (Roche Molecular System Inc.), using SYBR Green I reagant and primers specifically targeting FOXP1 and Presenilin 2.

RESULTS

Treatment with EnduBerry™ Nu at 0.1 % resulted in an increase of FOXP1 expression in aged fibroblasts (Figure 1). As FOXP1 is involved in cardiomyocyte proliferation and suppression of vascular inflammation, this may indicate a vasculoprotective effect of EnduBerry™ Nu.
Further, EnduBerry™ Nu led to increased Presenilin 2 expression, which may indicate a beneficial effect on mitochondrial function and cellular energy metabolism (Figure 1).

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Together the results indicate that EnduBerry™ Nu may promote cellular fitness by improving mitochondrial function and proliferation. This may translate to increased tissue energy levels, which can be beneficial in boosting overall physical performance.

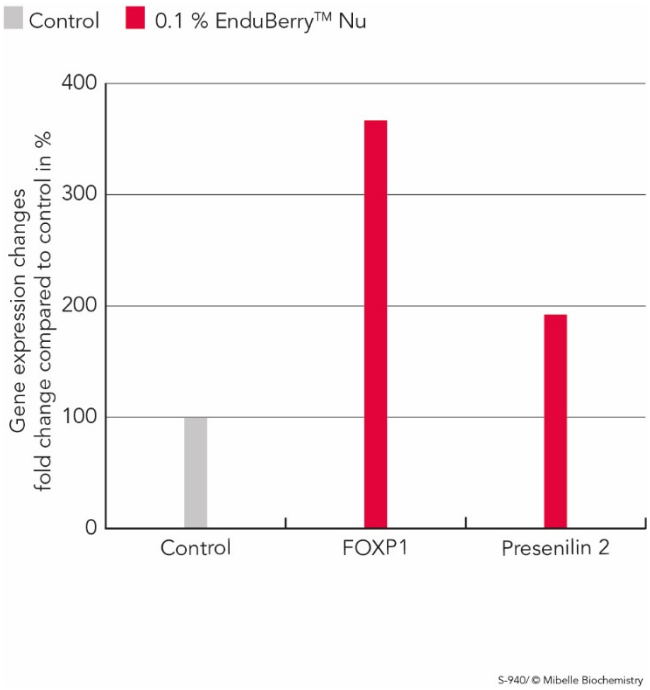

Figure 1. Increased expression of FOXP1 and Presenilin 2

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