Protective Effect of EnduBerry™ Nu against Protein Damage in Fibroblasts

S-980
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INTRODUCTION

In this study, the protective effect of EnduBerry™ Nu (a Haskap berry extract) on protein damage was investigated in human dermal fibroblasts by determination of protein carbonylation as oxidative damage marker. Protein carbonylation is a form of protein oxidation that can be induced by reactive oxygen species and is thereby also a marker for oxidative stress. Protein carbonylation impairs the function of intra- and extracellular proteins, thereby causing cellular and tissue dysfunction. Being one of the most harmful irreversible oxidative protein modifications, protein carbonylation is considered a critical hallmark of oxidative stress-related disorders. In this study, the protective effect of EnduBerry™ Nu in preventing protein carbonylation was evaluated. As inducers of protein oxidation either hydrogen peroxide (H_2O_2) or urban pollution, represented by a combination of UV-A radiation and fine dust (particulate matter (PM) pollution), were tested.

STUDY DESIGN

Cell cultivation and treatment

Human dermal fibroblasts were seeded in 96-well plates and grown in culture medium (DMEM supplemented with 10% serum). Cells were treated or not (control) with the reference compound N-acetylcysteine (NAC) at 0.33 mg/ml or EnduBerry™ Nu at 0.05 mg/ml for 24 hours. At the end of the treatment, culture medium was replaced and cells were either stressed with 100 µM H_2O_2 for 30 minutes, mimicking oxidative stress.

Analysis of protein carbonylation

After the treatment, cells were fixed to the plate with ethanol/acetic acid solution and carbonylated proteins were labeld with a specific fluorescent probe. After washing with PBS, the fluorescence signal intensity was recorded using a microplate reader (Varioskan, Thermofisher, USA). Results are expressed in % of oxidation level (=carbonylation) of the non-stressed control cells (set to 100%).

RESULTS

Stressing the cells with H_2O_2 led to a significant increase in protein carbonylation (oxidation) (+49 % compared to unstressed controls). Treatment EnduBerry™ Nu significantly decreased H_2O_2-induced protein oxidation. The oxidation levels of the cells treated with 0.05 mg/ml were furthermore comparable to the values of cells treated with the strong antioxidant reference compound N-acetylcysteine.

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In conclusion EnduBerry™ Nu significantly reduced oxidative stress-induced protein damage in human dermal fibroblasts.

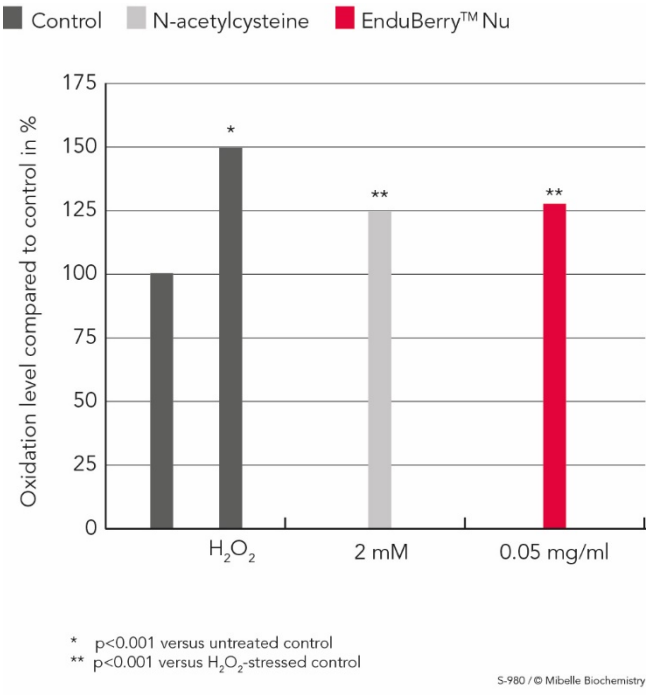

Figure 1. Decreased H_2O_2-Induced Protein Oxidation.

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