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Human Dermal Fibroblast Cells Application Note

Identifying Antioxidant Compounds for Personal Care and Cosmetic Product Development

Objective

Accumulation of reactive oxygen species (ROS) in dermal fibroblasts can cause oxidative stress and premature skin aging. To identify compounds which can prevent free radical buildup and/or treat oxidative stress inducers, Mattek's Normal Human Dermal Fibroblasts (NHDFs) were used to screen potential antioxidants.

Methods

Mattek's NHDFs (NHDF-CRY-NEO) were cultured in DMEM-10 according to manufacturer's protocol (Figure 1). Cells were pre-treated with increasing concentrations of potential antioxidant for 24 hours. Cells were incubated with 100 µm of 2'-7' '-dichlorodihydrofluorescein diacetate (DCFH-DA, 10µm) for 1 hour. Intracellular ROS was induced by a 1 hour incubation with 10mM H2O2. Levels of 2'-7' '-dichlorodihydrofluorescein (DCF), generated by ROS, were measured and changes in 485/528 nm ROS signal were copmared to control (Figure 2).

Figure 1. Human small intestine model cultured on PermaCell Insert, CCI24-PET-0.4, showing a highly differentiated structure with villi and brush border formation: A) H&E cross section, B) TEM micrograph.

Results

NHDFs treated with Antioxidant showed dose-dependent decreases in intracellular reactive oxygen species following induction by H2O2 (Figure 2).

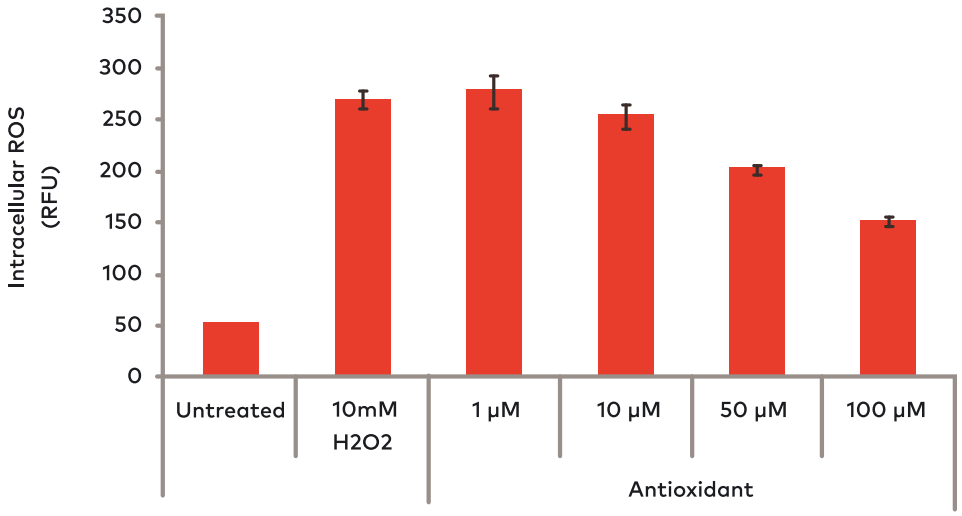

Figure 2. Mattek's Normal Human Dermal Fibroblasts (NHDF-CRY-NEO) were treated with increasing concentrations of antioxidant test compound for 24 hours and then exposed to 10mM H2O2. Significant decreases in intracellular ROS levels were observed with increased concentrations of Antioxidant.

Conclusion

Mattek's Normal Human Dermal Fibroblasts can be used to identify antioxidant compounds for personal care and cosmetic product development.