

YEAST FERMENT FILTRATE ENHANCES THE BARRIER PROTECTION OF SKIN KERATINOCYTES AND THE EXPRESSION OF FUNCTION-RELATED GENES

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INTRODUCTION

Yeast ferment filtrate (YFF; PITERA[®]), has been reported to prevent the epidermal damage caused by lipopolysaccharide and ultraviolet radiation. Mechanism underlying the effects of YFF on skin barrier function are not yet explored. The effect of YFF on epidermal keratinocytes, the outermost layer of skin, is worth to be elucidated.

OBJECTIVE

In the present study, we investigated the effects of YFF on the barrier protection and the expression of function-related proteins such as claudin-1, 3, 4, occludin and ZO-1 in cultures of primary epidermal keratinocytes.

METHODS

Primary epidermal keratinocytes were isolated from donors aged 30-40 and passage between 3-5 were used in all the experiments. Epidermal keratinocytes at 60-70% confluence were treated with YFF (0.1-1x) for 24 hours and the expressions of tight junction-related proteins

including claudin-1, 3, 4, occludin and ZO-1 were analyzed by Western blot method and fluorescent immunocytochemistry. Genes that could be regulated by YFF treatment were identified by cDNA microarray analysis.

RESULTS

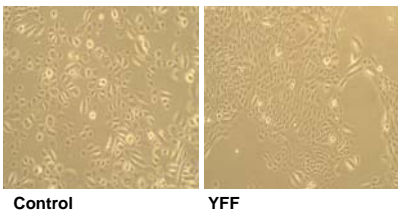


Figure 1. YFF induced the formation of a sheet-like structure of epidermal keratinocytes.

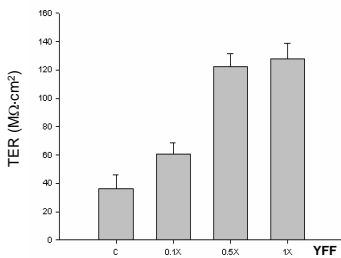


Figure 2. YFF dose-dependently increased the transepithelial electrical resistance (TER) of epidermal keratinocytes.

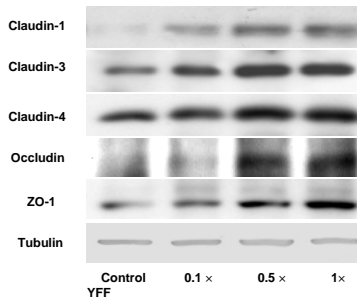


Figure 3. YFF increased the expression of tight junction-related proteins

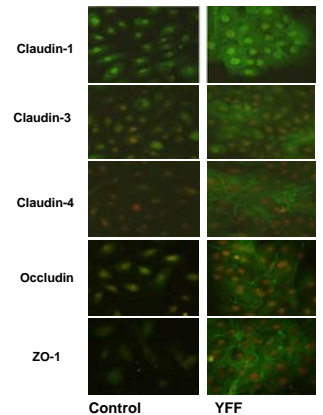


Figure 4. YFF increased the intercellular expression of tight junction-related proteins

Table 1. YFF also induced other barrier function-related genes as identified by cDNA microarray analysis

Small Proline-Rich Proteins
S100 Calcium Binding Proteins
Annexin A1
SKALP
Late Envelope Proteins
Trans-glutaminase

CONCLUSIONS

Yeast ferment filtrate (PITERA[®]) enhances the barrier protection function *in-vitro* of epidermal keratinocytes by increasing the expression of tight junction-related proteins and the TER value.

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3. Yuki T, Haratake A, Koishikawa H, Morita K, Miyachi Y, Inoue S. Experimental Dermatology 2007 ;16:324-30.